THE AUTOMOBILE

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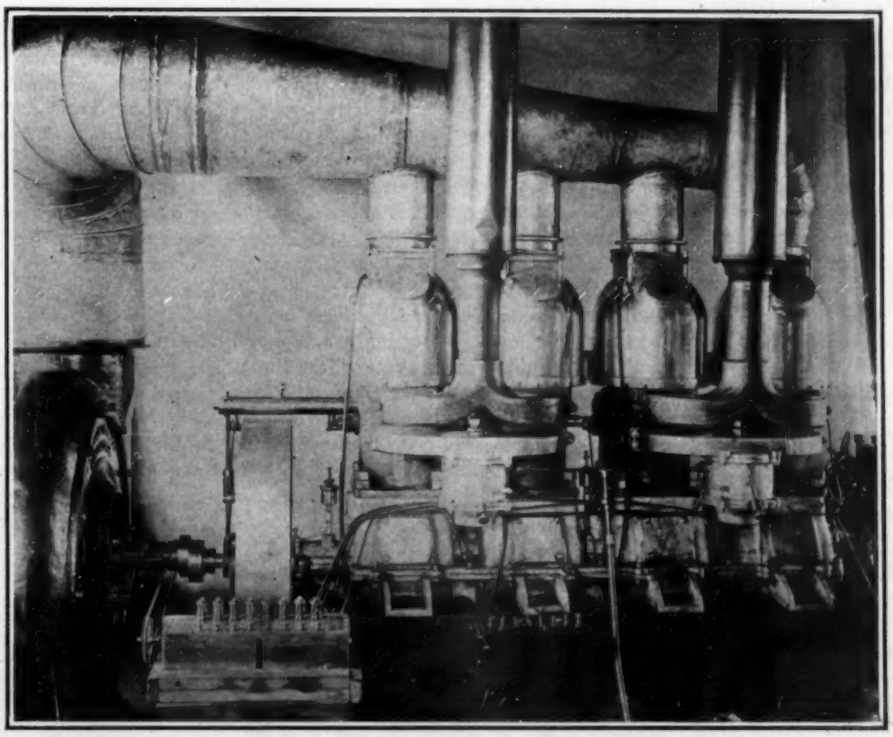
A 100-H.P. TWO-CYCLE AIR-COOLED MOTOR.

AN extremely interesting phase of the development of the explosion motor in its commercial form is in its adaptation to the propulsion of railroad cars; to this considerable attention is being given, both in this country and abroad, and the results, so far, are encouraging. The motors used for this work have, as a rule, been of practically the same type as large marine and automobile motors, with minor changes to adapt them to the new class of work. A motor recently completed for a western railroad, however, differs radically from others used for the same work, and combines a number of features which, in view of the conditions, are novel.



TWO-CYCLE AIR-COOLED MOTOR WITH 8x8-IN. CYLINDERS AND BLOWER.

In the first place, the motor is very large, having cylinders 8 inches in diameter and 8 inches piston stroke; and these dimensions are the more notable in view of the fact that the motor is of the two-cycle type and is air-cooled by convection. The motor is rated at 100 horsepower, and is, we believe, the largest air-cooled two-cycle motor that has been built, at least in this country. A further peculiarity, and one that is new in explosion motor practice, is that the speed is regulated by a flywheel inertia governor working on an oscillating throttle—a governor that has been in use for a long time in high-speed steam engine practice under the name of the Rites governor. The motor was designed and built by E. W. Roberts, M.E., of Clyde, O., for a western railroad, and will drive a dynamo which will charge a storage battery, the battery supplying current to electric motors on the car axles.

By making use of the three port system moving inlet and exhaust valves are entirely dispensed with, the admission of combustible gas and the escape of the exhaust taking place through ports in the cylinder walls, alternately covered and uncovered by the piston in its stroke. This system is in successful use in nearly all two-cycle marine motors and has been adopted by those automobile manufacturers who equip their cars with two-cycle motors.

In order to easily understand the working of the three port two-cycle motor, the operations may be followed step by step. Suppose the engine to be at rest, with the piston at the bottom of its stroke. If the crankshaft is rotated by hand, as is usual in starting an explosion motor, the piston will of course rise; as yet there is no communication between the interior of the crankcase and the atmosphere, so a partial vacuum is formed, the degree of vacuum depending upon the displacement of the piston with relation to the capacity of the crankcase, disregarding leakage. When the piston travels the last sixth (approximately) of its upward stroke it uncovers a port in the cylinder wall which communicates with the gas inlet pipe from the carbureter and a charge of gas is forced into the crankcase by atmospheric pressure.

Meantime, as there is no explosive charge in the cylinder, the cycle of operations must be completed by hand; for it is readily understood that a gas engine does not automatically take up and carry on its cycle of operations until an explosion has taken place, sufficient in intensity to rotate the crankshaft independently of outside aid. Therefore the piston must be returned to the outward end of its stroke by means of the hand crank, as would be the case in any ordinary four-cycle motor. As the piston descends, it first covers the port through which the combustible gas entered the crankcase; the gas is thus confined, with no means of outlet, ignoring possible leaks. The continued downward movement of the

piston compresses the gas in the crankcase, and the compression is continued until about the last sixth of the downward stroke when two ports are uncovered by the piston above the piston head.; one is the exhaust port, communicating with the atmosphere through the exhaust pipe, and the other, called the "transfer port," communicates with a passage leading from the crankcase. The exhaust port is uncovered a trifle earlier than the other for a reason that will presently appear.

Communication having been established between the cylinder, above the piston, and the crankcase, the gas in the crankcase passes into the cylinder with a velocity dependent upon the difference between its pressure and that of the air in the cylinder; the air in the cylinder is displaced by the incoming gas and escapes through the exhaust port, leaving the cylinder charged with explosive gas at approximately atmospheric pressure. Cranking being continued (it being borne in mind that we are now starting the motor), the piston commences to ascend, covering both the transfer port and the exhaust port, the latter remaining open a little longer than the other. These two ports closed, the gas in the cylinder is compressed by the movement of the piston until the upward limit of the stroke is reached and the charge is under compression at maximum pressure, when ignition takes place. Meanwhile a fresh charge has been drawn from the crankcase and is compressed as the piston is driven outward by the explosion of the gas which has just been ignited in the cylinder. The exhaust port, opening earlier than the transfer port, permits a portion of the burned gases to escape before the transfer port is uncovered, so that the pressure in the cylinder will not be greater than that of the fresh charge. The transfer port is uncovered and the fresh charge is transferred into the cylinder just as it was when the crank was turned by hand, the only difference being that instead of displacing air, the combustible gas displaces the burned charge. The fact that as the piston ascends the exhaust port remains open after the transfer port has been covered, gives the spent gas more time to get clear of the cylinder. These operations are repeated at every revolution of the crankshaft or every two strokes of the piston, from which fact comes the term two-cycle, an abbreviation of "two-stroke cycle."

Cooling is effected by convection, a forced current of air being delivered by a Buffalo blower into aluminum jackets surrounding the cylinders. The jackets do not encircle the cylinders in the ordinary way, but form helical passages around the cylinders, so that the actual mass of air is brought into direct contact with the heated surface. The blower is driven direct from the crankshaft through a flexible coupling, and is capable of delivering 3,000 cubic feet of air per minute at 750 R. P. M., this being the normal speed of the engine. The heated air, escaping from the jackets, passes out through a large sheet metal pipe which, when the motor is installed in the car, will be carried through the floor.

The speed of the engine is controlled by an automatic governor acting on the throttle, the latter being placed in the bronze passage between the crankcase and the cylinder transfer port. The governor is well known to steam engineers under the name of the Rites governor, and is of a type in which centrifugal force and inertia are employed. The governor weight, attached to the flywheel and held normally in full throttle position by a spring, is adapted to shift an eccentric on the crankshaft from full throw on one side of the shaft to full throw on the opposite side, the throw decreasing as the eccentric approaches the centre until, in mid-position, there is no throw. The eccentric rocks the throttle valve through a rod, the valve rocking at each stroke. The governor takes advantage of the fact that the charge is admitted to the cylinder during a very brief period only in the stroke; if the throttle is open during this period, it makes no difference whether it is open or closed during the remainder of the stroke.

Suppose the engine is just starting, the governor being in the wide open position with the eccentric on the full throttle side of the shaft. The throttle will be rocked so that it will be wide open at the instant the charge of gas is passing from the crankcase to the cylinder. As the engine picks up speed the eccentric approaches the centre under the influence of the governor weight, the throw decreases and the amount of throttle opening decreases, of course, in the same ratio, until, when the eccentric is on the center and imparts no motion to the throttle, the latter stands half open. If the speed of the engine continues to increase, the eccentric commences to swing toward the opposite side. The rocking throttle now contracts the gas opening more and more, until, when full throw is reached, the throttle is closed when the transfer port is open and opens at the top of the stroke, which, of course, counts for nothing, as the transfer port is covered by the piston.

There are two throttle valves, one for each pair of cylinders, and the same eccentric is made to operate both throttles by using two sets of rockers, one for each valve. Two carbureters are used, one for each pair of cylinders, working automatically by the varying degrees of vacuum produced at different engine speeds. The carbureters were especially designed for this motor, and are of aluminum; the same material is used for the gas supply manifolds, which are of rectangular section and give a wide, free passage.

A special cast steel is used for the cylinders with a view to securing lightness without sacrificing strength. Notwithstanding the size of the motor, the cylinder walls are only 5-16 of an inch thick. Large hand openings are left in the cylinder heads and are closed by flanged plates. Pistons are of iron, very long, and have four packing rings above the piston pin and a series of oil grooves cut near the bottom. The connecting rods are of the same cast steel as is used for the cylinders; the piston pin bearing is split and fitted with an adjusting screw, while the big end bearing is in halves, hinged.

Crankshaft, crankpins and bearings are very large; counterweights are attached to the cranks to balance the weight of the reciprocating parts. The cranks of the two forward cylinders are set at 180 degrees with each other, as are the cranks of the two rear cylinders; the forward pair, however, are at 90 degrees, or right angles, to the rear pair. The result of this crank arrangement is that the crankshaft receives a power impulse every quarter of a revolution; if the cranks were all at 180 degrees, there would be two simultaneous explosions in each half revolution.

The crankcase is cast of aluminum alloy and is divided horizontally. Each crank works in its own compartment, and in order to keep the compartments as nearly airtight as possible, and to prevent the leakage of the compressed gas from one to the other, packing rings are placed on the journals between the compartments.

Ignition is by jump spark, the timer, at the end opposite the flywheel, being driven at the same speed as the crankshaft by a silent chain. A bracket, bolted to the crankcase directly over the crankshaft, carries the timer and the timer sprocket. A quadruple coil is used.

A mechanical force feed lubricator supplies oil to the cylinders and to the crank pins. A positive lubrication system is found necessary for the crankpins, as in such a large motor the rush of gas through the crankcase carries off the lubricating oil very rapidly.

The motor, when installed in its car, will be direct coupled to a 75 kilowatt shunt wound dynamo, which will be driven at a speed of 750 revolutions a minute. The current from the dynamo will be used to charge a storage battery, from which four axle motors, of 50 horsepower each, will take current. By connecting the dynamo direct to the motors and using the storage battery at the same time, the full capacity of the electric motors can be made available for short runs. The engine and dynamo will occupy a space equal to that occupied by eight passengers; the seating capacity of the car will be 56 passengers. It is expected that the car will be in operation within a few weeks, when it will be placed in service on the line of a western road.

She knew something of the condition a man gets into when he runs his own automobile, and particularly of the oil and dust that covers his hands and clothes. So when her husband announced that he had just bought a car of his own, she remarked, with a sigh: "Now I suppose it will be a case of oily to bed and oily to rise."—Augusta (Ga.) *Chronicle*.

Light Cars at the London Shows.

From Our Own Correspondent.

LONDON, Nov. 22.—The French and other Continental manufacturers seem to have devoted their entire attention, up to the present, to catering for the automobile needs and requirements of the upper classes alone, and apparently have not, to any extent, supplied the wants of the middle classes—which will certainly be the largest users of automobiles in the near future. On the other hand, the British manufacturer has always studied the "man of moderate means," and in consequence the British light car has been brought to a state of perfection that probably surpasses the corresponding productions of Continental manufacturers. At the present London shows British cars of high powers are on view which are quite equal to any foreign car, but it is in the cars of lower powers and lower prices that the advance is more particularly evident.

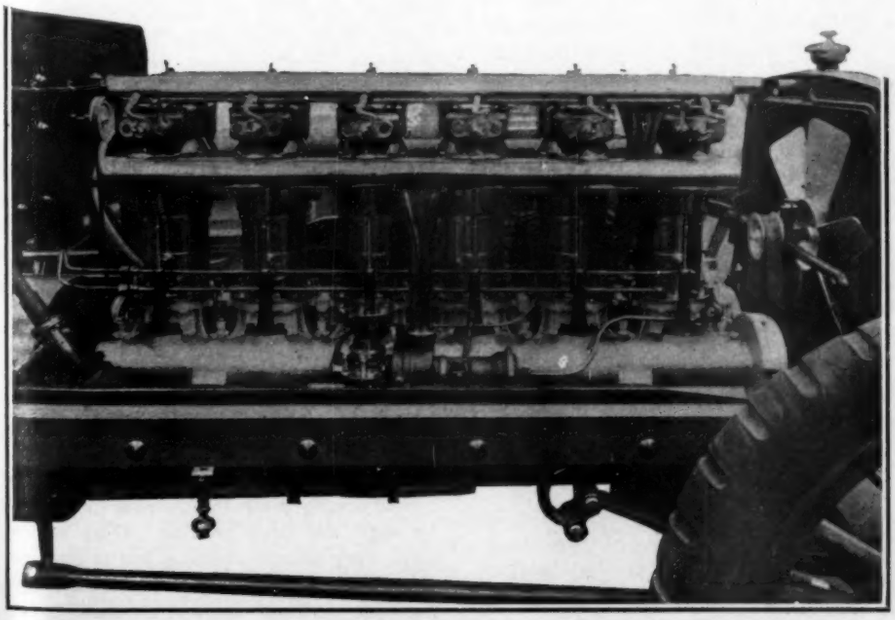
The sudden jump of the tricar into popularity has somewhat retarded the development of the lightest class of runabout, and until the present shows there was very little to choose between the $500 tricar and the $800 two-seated car of proved worth and reliability. Now there is a complete and unbroken range from the tricar to the 60-horsepower multicylinder machine of the millionaire.

A Choice of Runabouts.

Starting at the lower limit, a choice could be made from half a dozen voiturettes priced at $500 to $600. These are, in most cases, of the two-seated type and, except for detail work and fine finish, are merely smaller editions of higher-powered cars. The power ranges from 6 to 8 horsepower with one or two cylinders, although the one-cylinder model may reasonably be expected to be the better value. Armored wood frames with flitch plates are used in several cases, but the tubular type quite fulfills the requirements for these low powers.

Vertical engines are generally adopted, the advantages possessed by the horizontal type for such low powers being ignored for some unknown reason. The engine is placed under the bonnet in front and drives through a Panhard type gear box with three speeds and reverse, the final transmission being effected by either live axle or side chains, while in some cases a single chain is used. It is rather surprising that the early De Dion style of construction, with engine at rear axle and geared directly, does not find favor with manufacturers, for the early 4 1-2-horsepower models of this make could accomplish performances of which the modern 6 or 8 horsepower car would generally be incapable. Public opinion is usually responsible in such cases; the public considers the engine-at-rear type out of date, and this objection entirely overrules all theoretical advantages.

These cheap cars run successfully, but when, as is often the case, a tonneau is added, it is not surprising that the machine proves underpowered and the change-speed gear has its life shortened. As price rises the same type of car is offered, but with detail improvement and better finish. At the $850 price there is a good selection of two-seaters, and it is interesting to note that two of the principal cars of this price—the 6-horsepower Wolseley and the 7-horsepower, two-cylinder Star—are substantially the same for the coming season as they were two years ago. Such a fact is a good guarantee of quality and sound design; finality has apparently been reached in this type, for with low powers such as these there would be no advantage in multiplication of cylinders.



INLET SIDE OF SIX-CYLINDER PANHARD ENGINE, EXHIBITED AT OLYMPIA SHOW.

Where American Cars Come In.

Above this price foreign cars begin to make an appearance. French Darracqs and American Oldsmobiles, Pope-Tribunes, Cadillacs and others cause competition, and from $1,000 to $1,500 there is a fine selection of cars. Two-seaters are replaced by tonneau bodies, and the fashion for side-entrance *carosserie* has led to the introduction of the tonneau with entrance through the front seat, which is pivoted and turns out of the way. This style has been extensively adopted for 1906 models and gives the increased space of a side-entrance body without lengthening the wheelbase.

Two-cylinder engines of 10 to 12 horsepower are popular, but the four-cylinder type is coming rapidly into favor. The new 10-14-horsepower Renault has been described as the smallest four-cylinder car yet built, but over here one of the most successful light cars during the past year has been an 8-10-horsepower, four-cylinder model, while there are half a dozen 1906 models of less than 12 horsepower with four cylinders. Perhaps the two most representative of these are the 10-horsepower Star and the 10-12-horsepower Humber.

Representative English Light Car.

This last has replaced the 8-10-horsepower car above mentioned and is an extremely interesting machine, although built on standard lines. The Humber company's long bicycle experience has led it to retain the tubular construction for the frame, and, although opposed to general practice, there seems no objection to this. The engine has four cylinders set vertically; bore 90 mm. and stroke 95 mm., running normally at 1,000 revolutions per minute. Power is transmitted through a leather-lined, aluminum clutch to the change speed of the sliding gear type giving the usual three speeds and reverse, with direct drive on high speed. The live axle is driven by cardan shaft. The road wheels are fitted with ball bearings, as are also the gear shafts. The general workmanship is very good and the comfort of the driver has been well studied by giving a big rake to the steering column and placing the control levers on the wheel. Double-acting foot brakes are fitted to the driving shaft and hand brakes on the road wheels, actuated by hand lever. With entrance through swinging front seat this car is listed at $1,400, and the 10-horsepower Star car, which is very similar in general construction, but having armored wood frame and chain drive, sells at $1,300.

This class of four-cylinder car is extremely popular with British motorists and most manufacturers tend to this power for one of their models. It is interesting to note that there is nothing of foreign make

on the British market of this type at the same figure; the usual French four-cylinder is 15 horsepower and costs $600 to $700 more. It must be remembered that the British cars mentioned are light cars, and weigh usually about 1500 pounds.

With the next $500 rise in price a big selection of French and American cars is offered, but not till the $2,200 mark is passed is the approach to the medium-powered cars reached; up to this price there are, in general, modifications and detail improvements of the aforesaid four-cylinder cars, though there are several exceptions, among which a notable case seems to occur in the 8-11-horsepower Panhard three-cylinder model, which is down considerably in price and now comes within this class. The 16-20-horsepower car is very popular and no doubt if a detailed census were made it would be found that this power predominates. It is notable that at Olympia two new models of this class were to be seen on stands of makers who have hitherto been of the high-powered class only—the Fiat and the De Dietrich cars of 12-15 horsepower, which, no doubt, actually are about 16-20 horsepower. The English Daimler company, too, has priced its new 28-horsepower model at only slightly above this figure. Above this power the domain of the high-powered car is reached and an infinite variety of Continental models invite attention.

In all these various classes there are, of course, numbers of particular examples to which it is impossible to refer in detail; no doubt enough has been said to show that the general tendency is toward lower powers, the average British manufacturer being content to leave it to the French and two or three British firms of note to cater to the demand for high-powered machines.

PHOENIX MOTOR BICYCLE FOR WOMEN, EXHIBITED AT STANLEY SHOW.

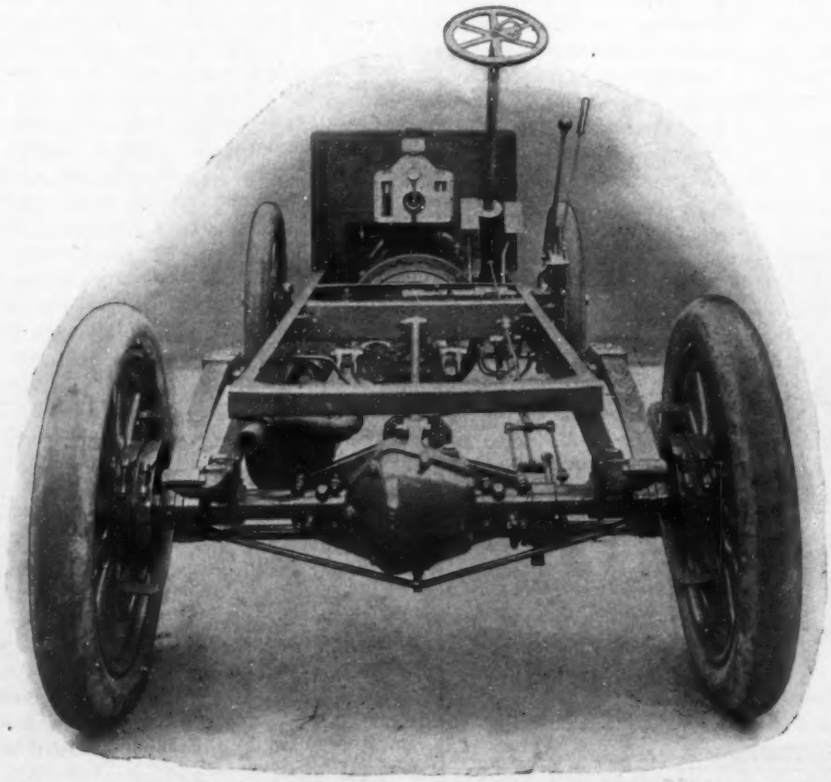
Motorcycles and Tri-Cars at the Stanley Show.

LONDON, Nov. 25.—This oldest established London cycle show, with twenty-nine years to its credit, has been much overshadowed by the Olympia exhibition, which has run concurrently for the past week, but nevertheless the Stanley show is of interest to automobilists as showing the progress made in the construction of motorcycles and the lighter and lower-powered classes of cars. The British motorcycle industry has developed to a great extent, and the number of motorcycles in use easily surpass that in France. From the early 1 1-2-horsepower, motor-assisted push-bicycles of 1902 the power increased until at the last show 3 1-2 horsepower was the popular rating. This year the two-cylinder engine of 4-5 horsepower is likely to become generally used, and numbers of machines of this class were displayed.

In spite of this tendency towards high powers, there is a strong feeling on the part of many motorcyclists—especially those old pedal cyclists, who have abandoned physical exertion for something easier—for a moderate-powered machine, and alongside the new two-cylindered "monsters" (which expression is quite justifiable in many cases) was generally staged a 2 3-4 or 3-horsepower machine, fitted often with an epicyclic, two-speed gear in the rear hub and belt driven. These smaller machines weigh about 120 to 160 pounds when ready for the road, compared with 200 to 250 pounds scaled by the two-cylinder mounts.

With regard to the latter, the engine is usually fixed at the bottom bracket with the cylinders set at an angle of 45 degrees to each other and, of course, lengthwise in the frame. This method has the objection that the rear cylinder gets rather hot, owing to the front cylinder receiving most of the air currents, and also that the oil is apt to be thrown up by the flywheels and accumulate in the rear cylinder. To overcome these difficulties several models have the cylinders at right angles, one horizontal and the rear cylinder vertical, while the English Roc and the French Werner have two small vertical cylinders side by side, set transversely across the frame.

The F. N. motorcycle, a popular Belgian production, has four small cylinders, developing about 1 horsepower each, set vertically and arranged tandem, driving by propeller shaft and bevel gearing. This engine gives very smooth running, but is open to the objection that the rear cylinders are liable to overheat. Most of the motorcycles on exhibition retain the pedaling gear for



CHASSIS OF IRIS (ENGLISH) TOURING CAR DISPLAYED AT OLYMPIA SHOW.

ease of starting, although spring footrests are sometimes fitted. Increased attention is being paid to the comfort of the rider, and many spring devices are shown, generally for providing a flexible connection between the front forks and the front wheel.

Ignition by storage battery and coil is more general than by magneto, although the magneto is rapidly advancing in popularity. Float-feed spray carbureters are universal; the old surface type is now extinct. As regards price, there has been a big slump in motorcycles at this show, just as the last Stanley show caused confusion in the bicycle trade by the unexpected drop in prices made by several large manufacturers. Last year the usual price for a 3 or 3 1-2-horsepower motor bicycle by a good maker was $180 to $200, but now in many cases the same value (apparently, if not actually,) can be obtained for $130 to $150—less than the price of some highest-grade pedal bicycles. The multi-cylinder models are priced at about $230.

Coming to motorcycles for two or more persons, the 'tricar" still retains public favor, but now it has changed from the glorified tricycle to the miniature car. Except for the absence of the rear axle and its replacement by a single wheel, there are all the refinements of a big car on some of the new models. Two-cylinder engine of 6—8 horsepower; water cooled with radiator and forced circulation; frame carried on carriage springs; wheel steering; clutch and gear box—all these are now demanded by the motorcyclist who wishes to have company on his rides. And certainly these handy little vehicles have proved very efficient and reliable in the recent contests promoted for passenger vehicles by the Auto Cycle Club. In ease of control, low fuel and tire cost, light weight and consequent hill-climbing powers, the tricar surpasses the runabout. The main disadvantage is, of course, the fact that the driver sits behind the passenger; but in some of the latest models the front seat will accommodate two passengers, and so increase the sociability.

There are some who still retain affection for the older type, and for these are provided lighter models with air-cooled engines, of 4-5 horsepower, and probably belt drive with two-speed gear. Nothing less than three speeds is usual on the big tricars, while a reverse is necessitated by the weight, which generally exceeds five hundredweights, bringing the machine under the motor-car regulations. The price of the larger tricars ranges from $400 to $500, and about $375 is asked for the lighter models.

In conclusion, while not exhibiting any radical alterations in design or construction, the show indicates a general advance in quality and workmanship, and the reduction in prices (which can hardly be expected to drop below their present level for some time to come) now places the sport of motorcycling within easy reach of all, so that a big further increase in numbers may be confidently expected during the coming season.

Figures on Source of Gasoline Supply.

THOSE who are interested in questions relating to the world's output of petroleum, will find an invaluable fund of information, chiefly statistical, in a special publication of the United States Geological Survey on the subject, just issued. The work is, of course, based upon official returns, and while, from its exhaustive nature, it is not strictly up-to or rather down-to-date, it is the latest and most authoritative work on the subject. Though the work has not been prepared for the special information of any particular industry, there are some facts and figures throughout that are of special interest to the automobile manufacturer and user, not only for present interest, but for future reference.

Totals covering the world's production of petroleum show that the output is steadily increasing in quantity year by year. In the year 1904 the United States led all other countries with a total of 117,063, 421 barrels (42 U. S. gallons) of crude petroleum out of a grand total for all countries of 219,162,501 barrels, or just 53.42 per cent. Russia, next on the list, contributed a total of 78,500,905, or 35.82 per cent. of the total output. All other countries collectively gave an output of the remaining 23,598,175 barrels.

These figures refer to quantity only. In quality, the greater proportion of crude petroleum produced in the United States is superior to any other in the percentage of valuable products secured by distillation—including, of course, gasoline.

Refined Products of Petroleum.

Approximate figures for the production of refined products of petroleum, which include the higher hydrocarbons such as gasoline and naptha, illuminating and lubricating oils, the United States gave a grand total of 2,212,498,656 gallons for the year 1904. In the same period the total for Russia was 565,407,602 gallons, while the rest of the world contributed only 247,700,840 gallons—significant figures.

An interesting resume of comparative tests of fuel values employing the ordinary mechanical apparatus for the translation of the energy stored in the fuel into brake horsepower is included. The comparisons, records of which follow, are on the basis of a weight of fuel of 310 pounds, which is equal to one barrel of ordinary crude petroleum, and the assumption that one pound of this fuel will evaporate fifteen pounds of water. For the steam engine one brake horsepower is assumed for every sixteen pounds of water evaporated. The results of the test show:

Comparative Values of Fuels.

High duty steam engines using best lump coal under boiler, 310 pounds = 190 brake horsepower hours.

High duty steam engines using petroleum under boilers, 310 pounds (1 barrel) = 291 brake horsepower hours.

Internal combustion engines using crude petroleum, 310 pounds (1 barrel) = 424 brake horsepower hours.

Diesel internal combustion engines using crude petroleum, 310 pounds (1 barrel) = 517 brake horsepower hours.

Automobile internal combustion engines using 70 ° B. naphtha, 310 pounds (1.4 barrels) = 530 brake horsepower hours.

Natural gas high duty internal combustion engines, 10 cubic feet per horsepower, 310 pound (6,800) cubic feet = 680 brake horsepower hours.

Comparing the results of the power derived from coal, petroleum and its products, and natural gas by the different methods of energy conversion under the conditions stated, and considering coal as 1, the following ratios are found: Petroleum under boilers, 1.53; petroleum in internal combustion motors, 2.23; petroleum in the Diesel motor, 2.72. Naphtha, 70° B., in automobile type motor, 2.79; natural gas in internal combustion engine, 3.58.

It will be noticed that mechanical or chemical efficiencies are here considered and that the serious commercial considerations of cost are omitted. Such considerations are possibly outside the functions of the book, but their inclusion would have added greatly to the practical value of the comparisons recorded.

Oil in Road Making.

Touching on the important use of crude oil in road making, a subject in which automobilists are especially interested, it is stated that California was the first to introduce the system. This has lately caused a demand for heavy natural asphalt petroleum and for the manufactured article. Oiling is particularly well adapted to a country where the roadbed is dusty or sandy. Its efficiency depends upon cementing the top of the road into a compact and stony covering, thus preventing the dust in a dry season and mud in a wet season. Numerous trials have proved its benefit and durability, although retouching is necessary, as local defects may develop. With petroleum selling at $1.25 to $1.50 per barrel, a 12-foot roadway can be constructed under ordinary conditions at an outlay of from $250 to $600 per mile.

After an exhaustive discussion, in which many delegates advocated drastic action, the annual convention of the National Grange, Patrons of Husbandry, at Atlantic City last week decided that the farmers should join in securing uniform automobile legislation of an equitable nature and to see that the laws were vigorously and relentlessly enforced. The penalties, it was agreed, should be heavy enough to serve as a deterrent against violation by others. The grange recognized that the automobile is an innovation in methods of travel that must be accepted.

Short Runs in and About Washington, D. C.

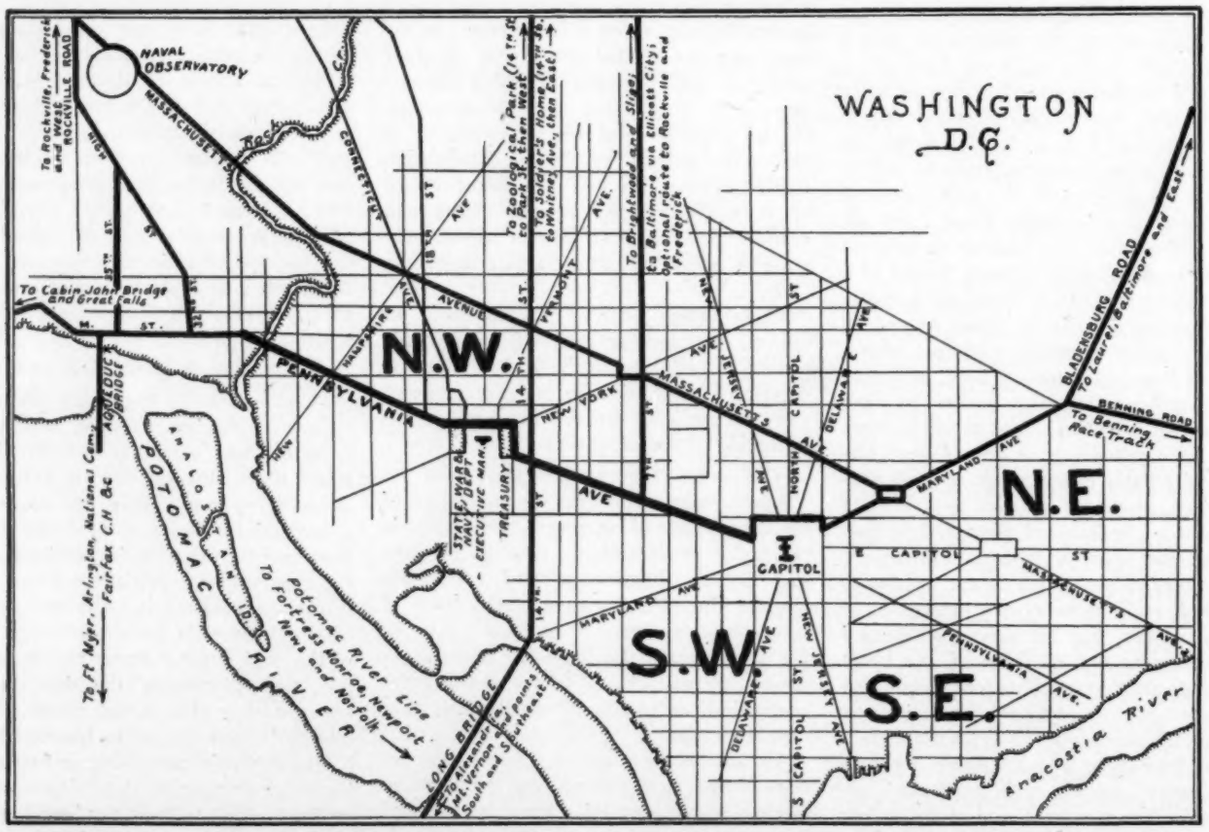
By ROBERT BRUCE.

WASHINGTON and its environs are, for all practical purposes, coextensive with the District of Columbia, though not exactly so. The city is divided into four subdistricts: Northwest, Southwest, Southeast and Northeast, all radiating from the capitol as a center. The dividing lines are North Capitol street, East Capitol, South Capitol and a line drawn west through the "Mall." Each sub-district—commonly abbreviated to N. W., S. W., S. E. and N. E.—has its own series of streets, with letters and numbers beginning at the capitol.

All thoroughfares are either numbered or lettered. Numbered streets run north and south, beginning with First street, at the foot of Capitol Hill, while lettered streets run east and west, beginning with B street, at the Mall. The avenues extend northeast to southwest and northwest to southeast. House numbers run from the capitol (odd numbers on the right) and in progression of 100 numbers to a block. From any point within the city limits the autoist is within a short distance of some prominent thoroughfare. In the north and west sections almost every street and avenue is asphalted; elsewhere macadam or some smooth block pavement is usually found.

The accompanying map will show the principal riding directions, within the city limits, toward the principal important points in and about the District of Columbia. A glance at this diagram will give, better than much description could, the idea of how to start on the various suburban trips, as well as on the longer tours, of which these might properly be called the initial stems. The principal through routes in all directions also coincide with the tracings on the map, so far as the diagram extends. Pennsylvania avenue, nearly five miles long, is not only the central thoroughfare, but it is the base from which all automobile tours in and out of Washington are reckoned.

Of the many local runs about the National Capitol, the most interesting to strangers are those to Cabin John Bridge and Great Falls, Arlington National Cemetery and Mt. Vernon. These will take one outside the city, though runs to the National Zoölogical Park, Rock Creek Park and the Soldiers' Home grounds are wholly or in part within the city limits. Strangers visiting Washington will have no difficulty in making any of these runs from the map, and the directions given under different subheads, in the following paragraphs: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NAVAL OBSERVATORY
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MASSACHUSETTS AVE
NEW YORK AVE
MARYLAND AVE
CAPITOL
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TREASURY
STATE WAR & NAVY - EXECUTIVE MANSION
POTOMAC RIVER
ARLINGTON
LONG BRIDGE
BLADENSBURG ROAD
BENNING ROAD
To Cabin John Bridge and Great Falls
To Rockville, Frederick and West
To Baltimore via Ellicotts City Optional route to Rockville and Frederick
To Zoological Park (14th St. to Park St. then West)
To Soldiers' Home (14th St. to Whitney Ave., then East)
To Laurel, Baltimore and East
To Benning Race Track
To Ft Myer, Arlington National Cem. Fairfax C.H &c
To Alexandria, Mt. Vernon (for points South and Southeast)
Potomac River Line To Fortress Monroe, Newport News and Norfolk
Anacostia River

WASHINGTON, D. C., SHOWING MAIN AVENUES TO PRINCIPAL POINTS OF INTEREST IN AND AROUND THE NATIONAL CAPITAL.

ZOOLOGICAL PARK AND SOLDIERS' HOME.

A short excursion, almost entirely within the Washington city limits—a trip which may take two hours or a whole day, according to the visitor's time and inclination—is that here briefly outlined. Each may be reached separately, in a dozen different ways, but this grouping will probably be found convenient by the locally unacquainted tourist. The National Zoölogical Park and the Rock Creek Park are two of the finest examples of landscape gardening on a big scale in the United States. The Rock Creek Road, which runs through both parks, beside the creek, is a splendid example of good road making, and, as it follows the creek, it has no grade except that of the running water, although a hill or so intervene between the city and the parks.

The best way is to start north on Fourteenth street, which crosses Pennsylvania avenue only one block east of the Executive grounds and the United States Treasury. New York avenue, Massachusetts avenue, Vermont avenue, Rhode Island avenue and other much-traveled thoroughfares cross Fourteenth street within two miles of Pennsylvania avenue. Go north on Fourteenth street to end of car line at Park street, then bear left (west) into Park street, which follow to Seventeenth street, keep straight ahead, downhill, making sharp right turn half way diwn; then cross bridge and bear right.

This is the Rock Creek Road, which winds in and out for five miles amidst the most beautiful kind of natural and artificial gardening. The road forks at the Military road; bear right to go to Brightwood and left for Chevy Chase. Brightwood, distant from the fork a mile and a half, is on the

NATIONAL SOLDIERS' HOME, OUT SEVENTH STREET AND WHITNEY AVENUE.

Seventh street pike; bear right into Seventh street for the city and left for Takoma Park, Silver Springs and Olney.

The Seventh street pike is a beautiful road in fine condition for its whole length and is a favorite speeding ground for motorists. Bearing right into Seventh street, turn left at Whitney avenue to the Soldiers' Home, which gives more parking and beautiful roads. At Brightwood, where the Military road runs into the Seventh street road, is a third fork, the Blagden's Mill road, which, although hilly, is good, and takes the autoist back to Fourteenth and Park streets.

There are any number of ways of getting into the Zoo and the Rock Creek Park; in fact, these parks and the surrounding suburbs are connected by a complicated network of fine roads, but as the intervening distances are short and travelers numerous, it is not difficult to find the way. A route to the Zoo used by some is Eighteenth street—parallel with Fourteenth street except that Eighteenth street makes an irregular left bend at its upper end to enter the lower edge of the park. Or Connecticut avenue, taken in a northwesterly direction from the Lafayette Square, opposite the Executive Mansion, thence an irregular left bend out Connecticut avenue extension, will take the tourist to the western edge of the park.

To Cabin John Bridge via Conduit Road.

The map will show at a glance how easily "M" street may be reached from almost any quarter of the city. One of the central east-and-west thoroughfares, this street might almost be said to divide Washington into halves. Crossed by the principal streets and avenues, it has many good city connections. Strangers, knowing principally Pennsylvania avenue, the great thoroughfare between the National Capitol and the Executive Mansion, have a nearly direct and simple course.

Going west on Pennsylvania avenue, bear right on Fifteenth street, where the way ahead is cut off by the United States Treasury. Go north two short blocks on Fifteenth street, alongside the Treasury; then turn square left on Pennsylvania avenue to pass between the Executive Mansion on the left and Lafayette Square on the right. At the farther corner of the State War Navy Building Pennsylvania avenue resumes a slight diagonal to the right and, immediately after crossing Rock Creek bridge, intersects "M" street at Twenty-eighth street.

From Washington's "uptown" the "N. W." section, all north and south streets and the principal avenues—Vermont, New Hampshire and Rhode Island—have simply to be followed to their intersection with "M" street. The latter, followed west from any point, will take the tourist out of Washington, by way of Rock Creek bridge into Georgetown, and through lower Georgetown to Thirty-sixth street. Here the Conduit Road begins, the point being conveniently marked also by the Aqueduct Bridge, a continuation (south) of Thirty-sixth street.

Do not turn down to this bridge, but go straight west into the Conduit Road. Now begins the most popular automobile run near Washington, along the north side of the Potomac river, all the way to Cabin John Bridge and Great Falls. The road is macadam in fine condition, except for a steep hill at the start, and another one half way to the bridge; it is smooth and level as a floor for nearly the entire distance and bordered by rows of growing trees. This course is open to pleasure travel when all other suburban thoroughfares are closed by bad weather.

It is called the "Conduit Road," from the fact that a large conduit, carrying the water supply of Washington from Great Falls, is laid underneath its center. Water system and road are both maintained by the Federal Government, under immediate direction of the War Department; the first three miles are in the District of Columbia, the remainder in Maryland. No advertisements are allowed at any point from end to end.

The route lies within a short distance of the Potomac river and the Chesapeake and Ohio canal, sometimes on a level with, at times above the river, passing first the Distributing Reservoir, then the Receiving Reservoir, one hill between. Among the river points over to the left along this course are the Chain Bridge, Little Falls and Glen Echo, the way unmistakable to Cabin John Bridge, ten miles from Washington.

Strictly speaking, this bridge is nine and one-half miles from the Executive Mansion and eight miles from the beginning of the Conduit Road; it is a favorite rendezvous for Washington autoists and the finest of local runs for visitors. Officially this is the

FAMOUS CABIN JOHN BRIDGE ACROSS THE POTOMAC ABOVE GREAT FALLS, A FAVORITE RENDEZVOUS FOR AUTOMOBILISTS.

"Union Arch" (built during the Civil War), but it is commonly known as "Cabin John Bridge," the name taken from the creek flowing underneath. It was formerly the longest single-span stone arch in the world.

On to Great Falls.

The same Conduit Road continues through interesting scenery all the way to Great Falls, making, however, a sharp right turn at the club house, about four miles from Cabin John Bridge. For part of the way the river makes a southerly bend and is lost to immediate view, but nearing Great Falls the former proximity is resumed. The falls are reached by crossing the canal over a lock and then the river itself over a swinging suspension bridge; beyond that a foot path leads to the site of Great Falls, seventeen miles from Washington.

Cars cannot get across this river line, but are left at the Great Falls Hotel, which, by the way, serves a fine dinner for 75 cents. Returning from Great Falls to Washington by far the best way is to reverse the outbound route. It is possible to take a short cross-road from either Cabin John Bridge or Great Falls to the Rockville Road (which does not come to the river at all until several miles beyond Great Falls), but this is not nearly so good as the Conduit Road. The mention of it here is principally by way of caution.

Arlington National Cemetery.

This route is identical in respect to all connections in Washington and Georgetown with the running directions already given in detail for the route to Cabin John Bridge; except that, instead of keeping ahead from "M" street into the Conduit Road, turn squarely left on Thirty-sixth street, crossing the Aqueduct Bridge, previously mentioned, over the Potomac, from Georgetown into the little town of Rosslyn, on the Virginia side.

From bridge exit go ahead a short distance (mud in wet weather, dust and ruts in dry) to fork of road. Then bear right and on over improving surface, up long, steep grade to top of plateau. Pass through Army Post grounds (Fort Myer—no "fort")—sharp, sudden turns, requiring caution—through the National Cemetery to Arlington Mansion, the Custis-Lee homestead.

The cemetery is open daily, including Sunday, from sunrise to sunset; splendid views of Washington and environs and the Potomac from these hills. See local guidebook for full information; impossible to give here. Return to Fort Myer and to Washington by same route or use local road connecting with Alexandria and return over the Long Bridge. To get to this road go south from the mansion to Arlington gate, on Alexandria Turnpike, then bear right to Alexandria, a good road in dry weather.

This would enter Washington by Maryland avenue at the water's edge, making left turn into Fourteenth street across the "Mall" and straight ahead on Fourteenth street to Pennsylvania avenue, which take by either right or left turn, according to destination in mind.

Alexandria and Mount Vernon.

Practically the only route to the home and tomb of George Washington is via the Long Bridge, Alexandria and the Mt. Vernon Pike. It is a hard and disappointing run, and if one cares only to see Mt. Vernon, the trip may be made better by electric car or boat. However, the trip has been made by automobile, and the principal directions are as follows:

Starting from Pennsylvania avenue, turn right or left, according to the point of start, to Fourteenth street. Turn from Pennsylvania avenue into Fourteenth street and go directly south across the Mall, coming into Maryland avenue at the water's edge, this avenue being at once distinguished by the railroad tracks upon it.

Enter the Long Bridge alongside the railroad tracks and cross over to the Virginia side. It is about one and one-fourth miles from the Executive Mansion to the exit from this bridge and about four miles more of rough, red clay and black loam roads, past brickyards, to Alexandria. Go through Alexandria to bridge over Hunting Creek; one-eighth mile beyond bridge turn left; one-half mile farther again turn left, following turnpike over Little Hunting Creek into Mt. Vernon, seventeen miles from Washington.

Highway of History.

In 1888 Congress made an appropriation of $10,000 for a private survey for a route of a Highway of History from Washington to Mt. Vernon, to run through Alexandria and along the Potomac to Mt. Vernon, a route often traveled by the Father of his Country.

Various through roads, most of them "pikes" in fair-to-poor condition, connect the District of Columbia with the towns and cities east, west, north and south. There are other local runs of unusual scenic and historic interest which the visiting autoist may wish to make, if time permits; for these also the directions indicated on the city map will be found of practical value.

Acknowledgment is gladly made of the co-operation of Mr. C. H. Claudy and Manager Hough, of the Washington Pope-Toledo branch, in the preparation of this data. Equally interested co-operation on the part of motorists in other cities would soon make the way of the tourist much smoother than it ordinarily is now.

KING EDWARD AND HIS CARS.

King Edward, of England, is constantly adding to his already extensive line of automobiles, patronizing mainly the English Daimler and German Mercedes makes. He has recently placed an order for a new English Daimler, which will be delivered shortly.

His Majesty's cars are the only ones in the kingdom which bear no number-plate, as even the Prince of Wales makes no exception to the general rule. Many tales are told of little adventures resulting from the absence of the numbers from the King's cars. Only a short time ago an energetic policeman, seeing an unnumbered car flash past him on a country road, telephoned to the police sergeant of the nearest town to hold up the offending vehicle, which was promptly done, to the bewilderment of the police officer, when he was made acquainted with the identity of the inmate of the car.

The King is a great lover of speed and is no respecter of the legal limit whenever a fine stretch of road gives an opportunity for a sprint. The Queen, who owns a charming white Wolseley car, prefers a measured pace, but her grandchildren of Wales enjoy nothing better than a ride with the Monarch himself. The King's chauffeurs wear no distinctive uniform, but a dark blue serge suit and the regulation staff cap to match. The mechanician-footman has, in contradistinction, a white canvas cap.

THE MAYOR "HIT THE PIKE"

Mayor McClellan was at his office in the City Hall yesterday, after a ten days' vacation. He said he was quite recovered from the fatigues of the campaign and ready to take up the work of the city's affairs again. He told an amusing story of his automobile trip to Princeton.

The machine broke down just beyond New Brunswick and left the Mayor and Mrs. McClellan stranded.

A farmer estimated that it would be worth $10 to bring his horses from the fields to drag the automobile to the nearest inn, but a good Samaritan volunteered to hitch up his mules.

Then the chauffeur started to guide the Mayor and Mrs. McClellan. The Mayor's hat was broken, and he carried a hamper of food, put up in New York, to meet any emergencies that might present themselves at the Princeton cottage. Mrs. McClellan carried a bandbox, and the chauffeur led a little Irish terrier, who wore a coat too tight for him, and looked as unhappy as, the Mayor says, he felt. Arrived at the inn, they were confronted by the landlady, who regarded them doubtfully.

"We don't take in professionals," she said. "You can easily walk the distance."

The chauffeur protested, and said something about "our car breaking down."

"Oh, yes, your car," said the landlady scornfully.

The sight of a ten-dollar bill, however, convinced the innkeeper that she was taking no chances.—*Tribune*, New York.

A New York man, after being run over by an automobile, was asked if he wished to prefer charges against the chauffeur, and replied that he did not, because it wasn't the chauffeur's fault. The heroic philosophers are not all dead.—Albany *Times-Union*.

Practical Experiences with Air-Cooled Cars.

By HARRY B. HAINES.

(*Concluded from page 546, issue of November 16.*)

Double Cylinder Air-Cooled.

EVENTUALLY I disposed of my single cylinder car and invested in a double cylinder one of the same make fitted with a horizontal opposed motor and cooled by the same system of radiating pins and fans as the single cylinder. The ignition system and control was about the same, but the machine of course ran much more smoothly. This machine was fitted with an automatic force feed oiler, which obviated many of the lubrication difficulties experienced with the older type of gravity feed oil cup.

Although I believe trouble has been experienced in some air-cooled cars on account of the breaking of inlet valves from the burning of the metal, I never experienced any such mishaps, all my trouble of this nature being confined to the exhaust valves, which would occasionally break off close to the head, the stem being weakened by the intense heat. Exhaust valve springs sometimes broke also, and when this occurred the motor would act exactly as if the valve itself had broken.

At times the engine would miss explosions and, as we termed it, would "spit." We went over the sparking system and batteries in vain, and finally after considerable difficulty, remedied the trouble by rigging up a new ground wire with a terminal on the frame of the car.

The spiral gears on the engine were subject to considerable wear, owing to insufficient lubrication. I devised a drop oiler that kept the gears well lubricated, and this helped matters a good deal. Later the manufacturers supplied an aluminum case for these gears, the case being filled with grease; after this no trouble was experienced. The double cylinder car is fitted with a very satisfactory lubricating system. I found that the best service was obtained by cleaning out the automatic pump and check valves every five hundred miles.

Testing Out Ignition.

With the peculiar style of ignition used on this car it was a rather difficult matter to test the spark in case of a skip so as to ascertain which cylinder was running and which was not. The plugs could, of course, be tested by taking them out of the cylinders and laying them on the iron frame of the car and then turning over the engine by hand with the switch plug in place, but at times a plug would spark outside the cylinder and then be dead when put in place and compelled to work under pressure. I found that a good method was to short circuit first the front and then the rear cylinder spark plug, while the engine was running, with a screw driver or some other metal tool, and in that way it was possible to ascertain which cylinder was working and which was not.

Another method was to hold the inlet valve on one cylinder, and keep it from working, and see if the other would operate the engine; and again, to disconnect the wires on either the front or rear cylinder spark plug and then try to make the engine run on one cylinder only. None of these methods, however, would give the positive cause of the skipping; it was not always the spark plug that gave trouble, as I soon learned. On this type of car the inlet valve is supposed to open 7-16 inch, and on one occasion the back cylinder went out of business as a result of the set nut loosening and the valve setting becoming deranged so that the valve did not open far enough to draw in a proper mixture.

Running on one cylinder with this car was almost impossible, but I managed to get home on one occasion with only the back cylinder working and covered a distance of twenty miles. The exhaust valve in the front cylinder broke and I did not happen to have a spare valve with me. There was nothing to do but to run home on one cylinder. I took the exhaust valve caging off entirely and also removed the spark plug from the front cylinder and so relieved the back cylinder of the work of pulling the "dead" one over against compression, after which it did considerable better.

Snow on the Spark Plug.

On one occasion I was stalled as a result of a rather peculiar occurrence. It was a cold winter day and there was considerable snow on the ground. I was running along at a fair rate of speed when the engine began to miss fire, and finally one cylinder went out of business altogether. I got out, and, taking up the front floor boards, saw that a large piece of hard-packed snow had been thrown up onto the front end of the cylinder and had lodged against the spark plug and was melting there. The water from the snow had short circuited the plug. Once the snow was cleaned away and the plug wiped off the engine resumed its functions.

The latest car of this type is fitted with an improved make and break, which does away with the stiff steel spring dropping into a slotted steel collar. My car had the old style ignition, and at the end of this spring there was a V-shaped metal block held in place by three small screws. This block dropped into the two slots on the collar and gave the spark for the front and rear cylinders alternately.

This block became loose on one occasion and caused a skipping of spark that was rather difficult to locate. While the engine was working, the tension of the spring and the rapidity of its action had kept the block in place, but when the motor was turned over slowly the block wiggled perceptibly. To tighten the screws was a matter of a few minutes' work, and I burred the ends of them to prevent a recurrence of this difficulty.

The inter-connection of the throttle with the spark advance as used in the single cylinder car was also employed in the double cylinder one and worked to greater advantage owing to the higher power of the engine. An independently operated gas and spark lever has since been designed and is proving more economical of gasoline. The throttle on the double cylinder was so arranged that it was fully opened before the spark was advanced to its extreme position, so that when the engine began to slow down on a hill it was possible to reduce the spark advance and favor the engine without shutting off the gas or changing the mixture.

I might go on indefinitely giving experiences of various sorts that I have had with this car, but space will not permit and I must generalize. Keep your compression good; keep your valves properly timed; keep your fan belts tight; keep your cylinder radiating pins clean; and feed lubricating oil liberally and your air-cooled car will give you satisfaction and service without limit.

The Four-Cylinder Car.

There are a number of four-cylinder, air-cooled machines on the market at present embracing various styles and ideas. My experience has been confined to one machine, a light runabout fitted with a four-cylinder motor in front and depending on the radiation of heat from its cooling flanges from the motion of the car.

My first impression of this car was that it could not possibly be kept cool on a hot day, but I found out that my judgment had been premature and that it not only could but did keep cool. Perhaps from the standpoint of the users of water-cooled engines that little four-cylinder was never cool at all, but despite the heat that it generated it always managed to keep cool enough to operate, and on only one occasion in 2,000 miles did the pistons stick, and that was because the automatic oiler gave out.

Ignition Troubles Infrequent.

Apart from the broken porcelains in spark plugs, the ignition troubles were not frequent, and in case of a skipping spark it was generally possible to determine which cylinder the trouble was in by holding down three vibrators on the coil at a time and so testing the sparking of each cylinder separately. This would give the condition of the spark plugs and enable me to ascertain whether the trouble was there or not. It was then a case of going to the contact points and then to the batteries and testing them.

I have found it a good scheme to crank the engine slowly until the contacts in the timer are closed. Under this condition a buzz should be heard from the vibrator of one of the coils. If no sound is heard the trouble is likely to be in the contact points of the timer corresponding with a particular cylinder or at the vibrator of one of the coils, or it may be in the wiring of this coil. If the engine be turned until the contact box makes the contact corresponding to the next cylinder and still there is no buzzing, it may be taken as a sign that the difficulty is not confined to one cylinder, but may be located in the batteries or in a short-circuited wire somewhere along the line, or in a defective spark plug.

The liberal use of kerosene on the inlet and exhaust valves helped materially in maintaining the high compression necessary to the successful operation of this motor. It was my practice to test the engine at regular intervals in an endeavor to keep the compression in the different cylinders as nearly uniform as possible, as poor compression in one or more of them resulted in a jerky and unsteady power and in overheating.

I learned before long that there were any number of reasons for lost compression. Defective piston rings, unseated exhaust and inlet valves, a spark plug that did not fit properly, were all causes that made themselves apparent.

Overhauling the Engine.

After a month or two of service the engine began to lose power, overheat and act rather strangely, and it was decided to have it thoroughly overhauled. It was taken to a shop for that purpose and the valve settings were gone over and found to be all right. The spark proved to be timed properly and the batteries were live and active. The coil also appeared to be in good condition. The carbureter was dissected and a little foreign matter was found in it but not enough to cause any real trouble or to block the flow of gasoline. The muffler was then taken off and cleaned out and we secured a new kind of lubricating oil and tried the car out again, but with no better satisfaction.

Hills that it would formerly take on the high speed could only be negotiated by slipping the clutch, coaxing the engine and finally resorting to the low speed gears.

Again we went back at the valves and attempted to retime them, but to no avail, and finally it was decided to take the car down to the floor and build it up over again in the hope of locating the trouble. When the engine was taken apart we noticed that the exhaust valve ports were clogged and narrowed down to about one-third of their former size, being filled with a hard substance, the deposit from heavy lubricating oil used when the machine first came. This had baked on so hard that it was necessary to take a hammer and chisel to get it away from the iron.

It was then found that the seat of one of the exhaust valves had been badly battered and it was necessary to have this put in a lathe and touch it up and then grind the valve to fit it. The crank pin bearings were slightly cut in some places, but did not need replacing. The piston ends and explosion chambers were found to be covered with little deposits of carbonized oil, and it was this that had been causing premature explosions and the consequent overheating.

The machine was finally reassembled and was tried out and seemed to have regained its old-time power. Everything went well for a few weeks and we had no trouble, when suddenly the machine developed a new freak and refused to run steadily at high speed or on very rough roads. This proved to be a real puzzle, and it took us several days of experimenting to locate the trouble, which finally proved to be in the carbureter. The guiding rod on the float valve, which is located on top of the carbureter, fitted too loosely at both ends and would not shut off the gasoline when the machine was vibrating either from high motor speed or when traveling over rough roads. This was easily remedied by the mechanic at the shop.

Didn't Use Proper Oil.

Our next trouble was caused by a careless boy at the auto garage, who filled the crank case and automatic oiler with a heavier grade of oil than we had been using, and after the first day the car began to run badly. Eventually I left the machine out of doors for a few hours on a cool night and came out to find all the compression gone. The engine turned over easily and freely, but there was not an ounce of compression, not even enough to operate the inlet valves. I monkeyed around for a time and finally took to squirting gasoline on the inlet valves and working the fluid into the cylinder, but with no result. I had a good hot spark, but there was "nothing doing." Finally I took out the inlet valves one after the other and washed them in kerosene and then poured a quantity in each of the cylinders and turned the engine over by hand. In a few minutes the compression returned as strong as ever and I was able to navigate again. The heavy oil had become chilled and gummed up the piston rings and the exhaust valves, causing the trouble.

In cold weather I found that this engine was easier to start and to keep in operation than the single or double cylinder one. If I left the machine standing all night and it was cold when I came to start it I was generally able to get an explosion by priming each of the inlet valves with kerosene and then turning the motor over by hand to work the fluid down into the cylinders, after which I primed them all with gasoline and then, throwing on the spark, turned the handle.

Speaking in General.

Generally speaking, I would say that, all things taken into consideration, the air-cooled car is equally as desirable as its water-cooled brother and has as many advantages and as few disadvantages. Both types have their peculiarities and their troubles, and both are particularly adapted to the work they do.

The question of the best sort of a car to buy is one that must be left the individual. The experiences of his friends and of other users may be of assistance to him, but, after all, his own judgment will finally weigh the scales in favor of the car on which he has really set his heart and, luckily for the manufacturers, we all have our own ideas and ideals.

OUR FOREIGN COMMERCE.

Exports and Imports for October and Ten Months Ending with October.

Exports of automobiles and parts from the United States are given by the countries of destination for the first time in the October number of the *Monthly Summary of Commerce and Finance*, as published by the Bureau of Statistics of the Department of Commerce and Labor. The figures are given as follows for October, 1905, and for the ten months ending with October:

Exported to—	Oct., 1905	Ten mos. ending Oct., 1905.
United Kingdom	$ 50,136	$604,782
France	2,190	254,030
Germany	8,162	101,998
Italy	1,740	154,325
Other Europe	8,903	222,817
British North America	18,715	501,765
Mexico	13,464	150,042
Other West Indies and Bermuda	12,274	124,552
South America	5,571	48,938
British East Indies	3,620	28,602
British Australasia	4,043	85,548
Other Asia and Oceanica	1,318	60,591
Africa	2,716	28,737
Other Countries	1,136	2,894
Total	$133,988	$2,369,621

The total for the month of October shows an increase of $3,117 over the exports for the same month a year ago, and the total for ten months shows an increase of $792,744 over the same period in 1904 and of $1,057,661 over the corresponding period in 1903.

Imports of automobiles, which have not previously been enumerated in the bulletin, are now being published, but are not given by countries of origin. The report shows that ninety-five cars were imported during October of this year, being of a total valuation of $409,841, and that during the same month parts valued at $17,921 were brought in. During ten months, ended with October, 390 cars, of a total value of $1,475,299, were imported, and parts were brought in to a total valuation of $86,674. There are no earlier statistics with which these figures can be compared.

Letter Box

About the New Bleriot Light.

Editor THE AUTOMOBILE:

[289.]—I read with a good deal of interest the article on French lamps, and especially on the new Bleriot light. I have looked into the matter somewhat and thought that a few facts might be of interest. The light, as many will readily see, is a modern adaptation of the oxy-hydrogen, or lime, light formerly used very extensively for stereopticon work and for stage lighting until displaced by the electric arc light, with which it compares very favorably as to brilliancy. This last feature, its great illuminating power, would probably be its main advantage over acetylene, as it is much more expensive to operate. Oxygen gas costs from six to eight cents a foot delivered in cylinders. Then, of course, there is the cost of the earth pastile or lime cylinder, which has to be renewed with more or less frequency. The cost of the necessary naphtha can be neglected. The ordinary stereopticon uses about six feet of oxygen per hour; the probability is, however, that an automobile searchlight could be operated on about two feet per hour.

On the other hand, the oxygen need only be turned on just when the light is needed, and the strength of the light can be regulated to a nicety by the amount of oxygen used. Without the addition of the oxygen, almost no light will be given off by the action of the flame on the pastile.

The labor of upkeep, with the exception of lighting up the gasoline burner, would compare very favorably with acetylene, even where a tank is used. The main trouble would probably be in getting the cylinders filled with gas at the light pressure used.

HAROLD H. BROWN.

Boston, Mass.

Remedy for Back Draft in Steamer.

Editor THE AUTOMOBILE:

[290.]—I have noticed inquiries in THE AUTOMOBILE as to how to prevent the blowing back of the fire in a steam car on a windy day, and have been reminded of my own troubles and their cure. Several times I have been asked my opinion of the closed burner system, and I answered some that I did not favor it because of the probably imperfect combustion. I was moved to experiment, however, and covered up all the flue holes in a common plate burner with a sheet of asbestos, so that all the air used had to enter through the mixing tube. Of course this arrangement smoked at first, but I found it possible to stop the smoking by reducing the size of the gas aperture till I got a fire that looked the same as that produced with the flues open. To my astonishment, I discovered that I obtained rather more heat than before, with a trifle more than half the consumption of kerosene, which is the fuel I use. The blowing down of the fire was absolutely and finally cured. The experiment is well worth trying; doubtless it would work as well with gasoline as with kerosene. The sheet of asbestos is, of course, placed under the burner, so as not to close the gas aperture. G. A. H.

Decatur, Ill.

St. Louis Club on the Warpath.

Editor THE AUTOMOBILE:

[291.]—Vigorous action by the St. Louis county officials has brought about a peculiar state of war here. They have stationed deputies along the roads, who mark off distances of 3,000 feet and with stop watches time all automobiles that pass. Needless to state, they stop all machines going more than fifteen miles an hour, and, in most instances, at the point of a revolver.

The Automobile Club of St. Louis has taken up the matter and appealed every case. The state law requires all machines to keep within a speed limit of nine miles an hour. The law further allows each and every county to require the owner of every car used on the roads of that county to secure a license; consequently, to run a machine through Missouri, entering every county, would cost about $250.

As a matter of protection, the club has engaged three detectives, who keep the deputies in sight and then warn approaching automobile drivers of their presence. In the last three days we have prevented fifty arrests. Two deputies, who have been particularly energetic, lay in waiting from 9 in the morning until 4 in the afternoon. Seventy machines passed them going less than nine miles an hour, and about 4 o'clock in the afternoon they got disgusted and returned to the saloon, where they have been ever since. Our men stopped every machine and by their warnings saved a great deal of trouble.

As a result of this sort of work, we have almost doubled our membership. The club is in close touch with the street department of St. Louis and is forcing the street railway companies to improve their crossings. Police regulations within the city are very satisfactory; we are allowed a speed of about eighteen miles an hour.

The club members agree with the editorial in your issue of November 23 regarding the use of reflecting gas lamps in the city. The glare of these strong lights is sufficient to frighten anything that comes within their range.

A. B. LAMBERT,
Pres. A. C. of St. Louis.

St. Louis, Mo.

Enclosed with the foregoing letter were two public notices issued by the club. One was a "caution," advising automobilists that if they ran their cars at more than nine miles an hour they were liable to be held up "by rather suspicious-looking individuals, with long revolvers" pointed in their faces. It announced that the automobile club had retained an attorney to protect its interests, and that the arrests made on the previous Sunday would be appealed and, if necessary, carried to the highest courts. It proclaimed the intention of the club to test the state law which permits each county to charge $2.50 for a license even to pass through the county with an automobile. Reckless driving was charged with being instrumental in bringing about the objectionable state of affairs. The bad condition of the streets was pointed out and automobilists were called upon to add their protests to those of the club, in the hope of making them more effective.

The other notice announced the intention of organizing the automobile clubs of St. Louis, Kansas City and St. Joe into one association to invite the coöperation of automobile owners throughout Missouri in a request of the legislature to pass a bill creating a state license, uniform speed limits and other regulations necessary to public safety, yet giving equal rights to automobilists. As such things need strong representation, the unaffiliated owners were invited to become members of the club to help the work along.

WANT ACTION BY CONGRESS.

WASHINGTON, D. C., Dec. 4.—It is on the program that Congress, which convenes today, shall take some action this winter looking to the protection of Washington automobilists from the many annoyances to which they are constantly subjected.

During the week President Duvall, of the Automobile Club of Washington, had a conference with District Commissioner West and Judge Kimball, of the police court, relative to the matter, and it was decided that Congress should be asked to make certain amendments to the "peace and order act" of July 8, 1898. One of these proposed amendments is that the fine for "taking and carrying away the property of another without the right to do so," be increased from $40 to $100, with imprisonment for six months, or both, at the discretion of the court. Congress will also be asked to make certain changes in the phraseology of the act, so that "taking and carrying away" shall be held to cover the movement of automobiles without the offender actually taking and carrying away the machine.

The club has also suggested a heavier fine for the offense of assaulting passing automobilists by hurling stones and other missiles at them.

A power boat postal service is to be opened on the Venetian canals and lagoons early in January, and it is quite within the realms of possibility that enterprising persons will "run" a line of passenger auto boats on the waters of the Italian city over which the poets rave.

Redd—Is he given to blowing his own horn?

Green—Oh, no; he has a chauffeur.—Yonkers *Statesman*.

Marion New Air-Cooled Model.

IMPORTANT changes have been made in the 1906 air-cooled car manufactured by the Marion Motor Car Company, of Indianapolis, Ind. The new Marion car, Model 5, is a large touring car with the air-cooled motor, of 28 horsepower, placed fore-and-aft under the bonnet in front; the 1905 car had the motor placed transversely. The new machine is fitted with a multiple disc clutch and three-speed sliding transmission gear in place of planetary gearing, while drive to the rear wheels is by side chains, as was the case with last year's car. The horsepower has been increased from sixteen to twenty-eight. As in last year's car, four cylinders are used.

All the valves are mechanically operated; a feature of the 1905 car that is retained is that the exhaust valve, opening directly through the cylinder head, is of large diameter. This valve is operated by an arm projecting from the top of the operating rod, as the photograph of the engine shows. Long guides take the side thrust. The inlet valves are on the left-hand side of the motor, while the exhaust manifold leads off on the right-hand side. A method of lubricating the engine has been adopted which, the manufacturers state, is reliable, regardless of temperature, and is efficient and economical, avoiding the smoky exhaust frequently due to excessive lubrication. The cylinders have a bore and stroke of 4 1-2 inches each.

Bearings throughout the car are of large dimensions so as to give long wear. The main bearing of the crankshaft, next to the flywheel, is 1 3-4 inches in diameter and 4 1-8 inches long; crankpin bearings are 1 3-4 inches in diameter and 2 1-2 inches long; and the piston pin bearing is 1 1-4 inches in diameter and 2 3-4 inches long. The bearings of the transmission shafts are also very large.

A single aluminum casing contains the multiple disc clutch, the sliding gear transmission, the bevel driving gears and the differential. The gears give three speeds forward and one reverse, the drive being direct on the high gear, when no gears are in mesh except the bevel driving gears, the countershaft remaining stationary. The reverse gears are in mesh only when the car is being driven backward. Very long bearings are used, and lubrication is effected by means of ring oilers dipping into oil wells below the bearings. The jackshaft is supported at its outer ends in non-adjustable ball bearings, the bearings being carried by tubular extensions of the gearcase through which the jackshaft passes. A single lever controls the sliding gears. The multiple disc clutch runs in oil in the forward part of the aluminum casing, the power of the engine being transmitted to it through a universally jointed shaft.

Drive is by side chains from the jackshaft to the rear wheels; the sprockets on the jackshaft are solid and have twenty-five teeth, while the sprockets on the rear hubs have forty teeth and are attached to the brake drums. The large size of the sprockets is said to have the effect of rendering the chain drive very quiet. The brake drums contain two sets of internal expanding brakes, one being the regular service brake and the other the emergency brake. The expanding rings are placed side by side and are entirely enclosed in the drums.

The framing is of pressed steel, and the car is mounted on full elliptic springs in front, where the weight is greatest, and semi-elliptic scroll springs in the rear. The radius rods are so arranged that the tension of the chains does not vary with the vertical movement of the body on the springs. The radius rods take all the braking strain, relieving the springs of this work.

Wheels are 32 inches in diameter, with 3 1-2 or 4-inch tires. The road clearance is 10 inches, though the car has the appearance of being low hung. The weight of the complete car is 1,950 pounds, this figuring out at about 70 pounds for each horsepower of the motor. The body is of attractive modern design, and is comfortably upholstered; five passengers can be seated, the wide rear seat having ample room for three.

More Details of Brasier Designs.

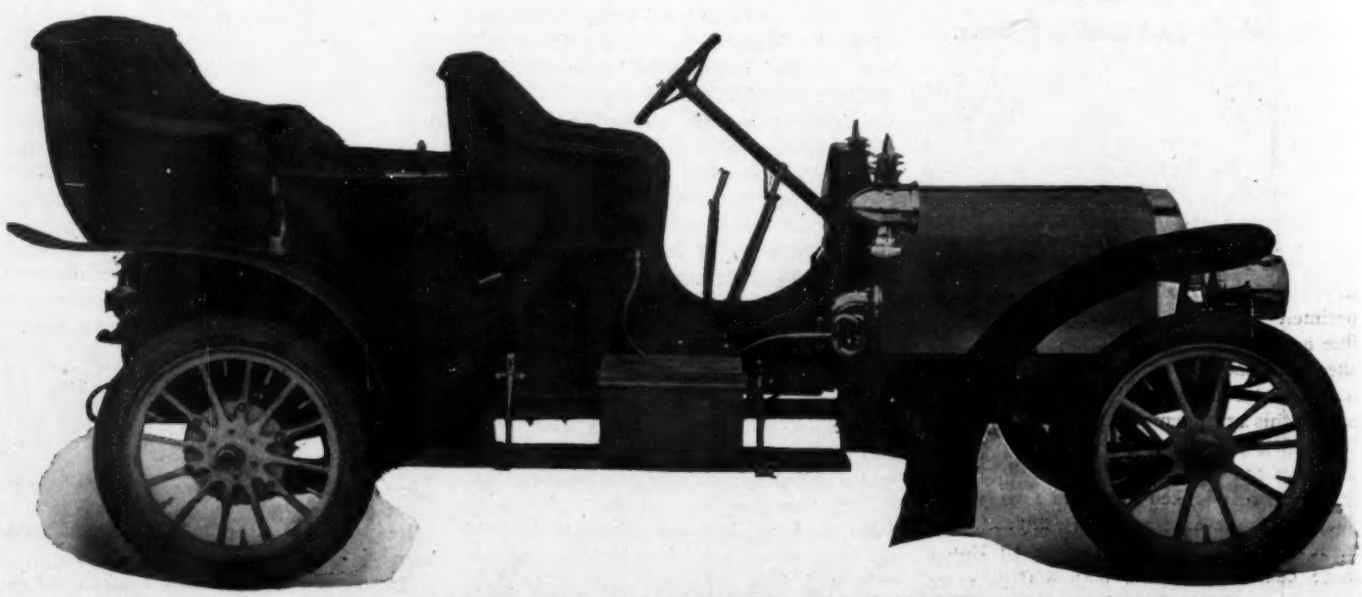
Herewith are given some details of ignition, lubrication, transmission and drive of the Brasier designs which were omitted through an oversight from the description published in last week's issue (November 30) of the 1906 models of Richard Brasier cars.

The camshafts are made stouter in diameter than they were formerly and are cut from the bar with the cams formed integral; this suppressing the play that is likely to take place in the course of time with keyed cams, and giving at the same time a neater and stronger construction, though, of course, a more expensive one.

Profile of the Cams.

The profile of the cams is such that it gives a flow of gases proportional to the speed of the piston during the different portions of the stroke, the effect of the momentum of the charge and other factors of disturbances being carefully calculated and taken into consideration with a rather unusual care, the recompense for which is found in the high power given out by the engines, considering their size and weight.

The distribution gears are made stronger than on the previous models; they are mounted on the tapered ends of their shafts and keyed there, a nut drawing the whole together.



MARION 28-H.P. 4-CYLINDER AIR-COOLED TOURING CAR WITH SLIDING GEAR TRANSMISSION AND SIDE CHAIN DRIVE.

The crankcase casting is of a new shape, fitted with interior guard plates, so as to prevent excessive splashing of oil on to the cylinder walls, disagreeable experiences on Caillois Gordon Bennett racer having shown this to be a desirable improvement. It at the same time permits an unusually large amount of oil inside the crankcase to lubricate the crank pins and main bearings.

Ignition by Magneto.

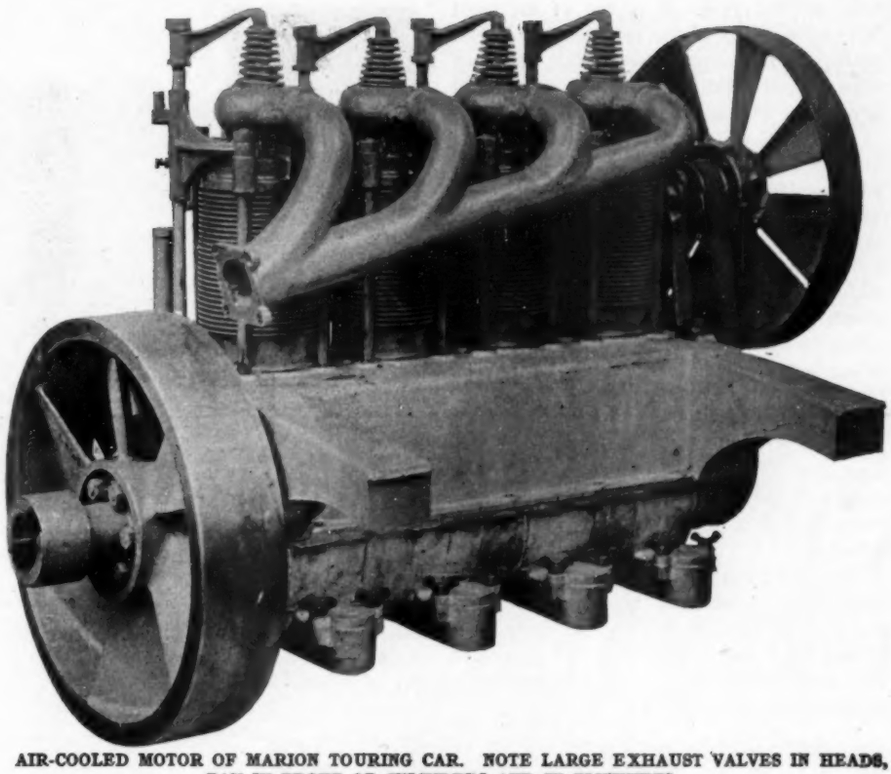
The ignition is by magneto, and the usual Brasier make-and-break device, which is water cooled. A most interesting change has been made in this system, which should overcome many of the objections that are often raised to the make-and-break system. All the array of rods, springs, levers and sundry hardware generally found in make and break is done away with and is replaced by a special camshaft horizontally mounted on top of the cylinders and running in ball bearings. The cams carried on this shaft directly actuate the outside tail of the internal strikers of the ignition plugs. The vertical shaft which drives the ignition camshaft from the lower timing gears carries an automatic dog-clutch coupling, which has for its purpose to cut out the drive to the upper shaft in care of a back fire in the engine, causing it to run in a reversed direction. The magneto is fastened to one of the carrying lugs of the crankcase, and is held by hinged stem bolts, which make its removal an easy matter. It is direct driven, the separate shaft and couplings hitherto used being done away with.

The 15- and 25-horsepower sizes are fitted with a hand lever on the side of the driver's seat, which permits of cranking the engine by a simple oscillating motion without leaving the seat. (Described in the November 16 issue.)

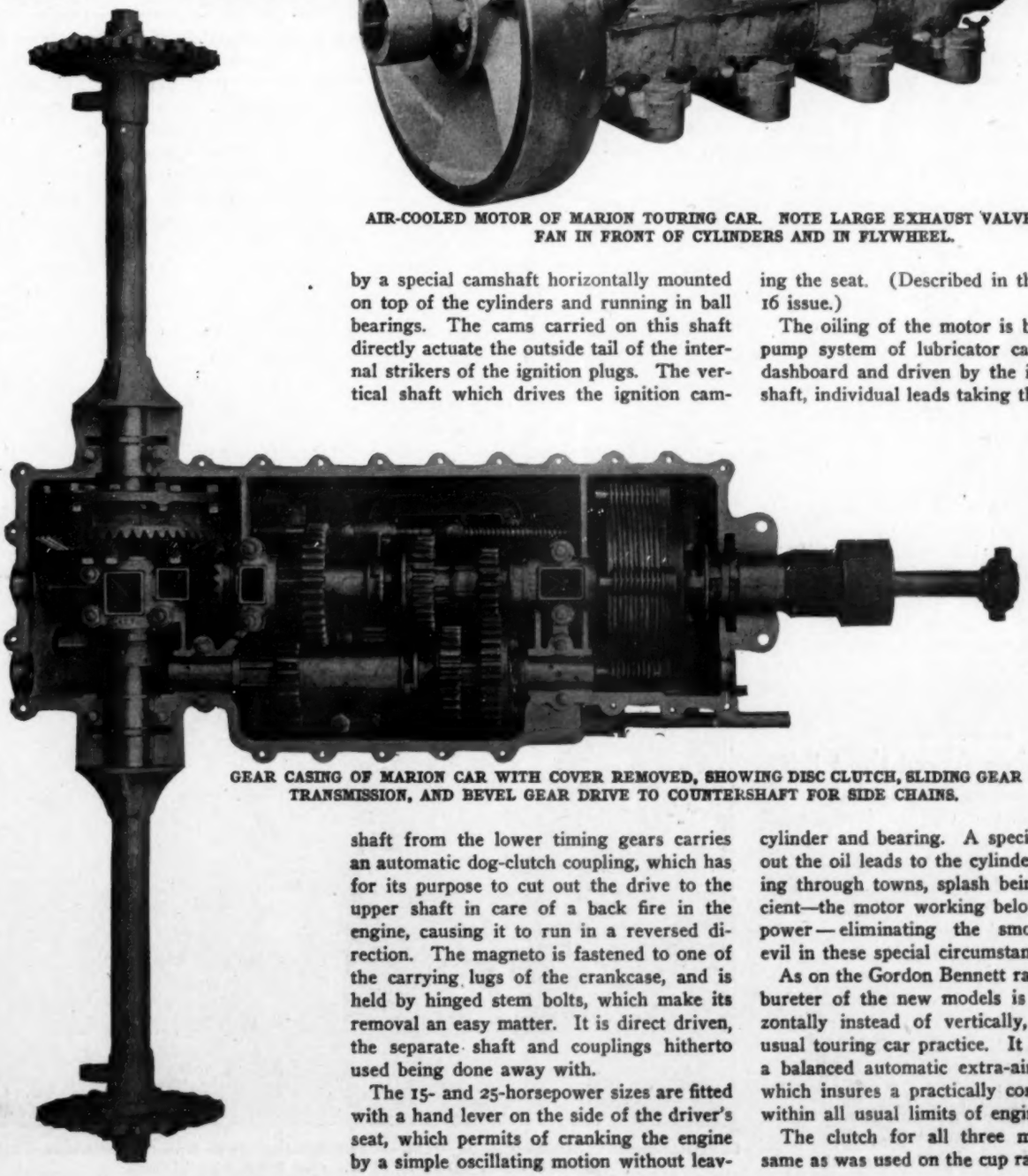
The oiling of the motor is by a plunger-pump system of lubricator carried on the dashboard and driven by the ignition camshaft, individual leads taking the oil to each cylinder and bearing. A special valve cuts out the oil leads to the cylinder while driving through towns, splash being then sufficient—the motor working below its normal power—eliminating the smoke-and-smell evil in these special circumstances.

As on the Gordon Bennett racers, the carbureter of the new models is placed horizontally instead of vertically, as was the usual touring car practice. It is fitted with a balanced automatic extra-air inlet valve, which insures a practically correct mixture within all usual limits of engine speed.

The clutch for all three models is the same as was used on the cup racers for both



AIR-COOLED MOTOR OF MARION TOURING CAR. NOTE LARGE EXHAUST VALVES IN HEADS, FAN IN FRONT OF CYLINDERS AND IN FLYWHEEL.



GEAR CASING OF MARION CAR WITH COVER REMOVED, SHOWING DISC CLUTCH, SLIDING GEAR TRANSMISSION, AND BEVEL GEAR DRIVE TO COUNTERSHAFT FOR SIDE CHAINS.

this and last year. It is one of the most interesting parts of the machine. It is primarily a leather-faced cone clutch, but fitted with special locking system, giving a rigid drive once the clutch is fully engaged.

The locks consist of steel plunger rods, held in slides in the male clutch member and constantly pushed in their furthest forward position by means of small coil springs. The length of these plungers is such that they clear the web of the flywheel which forms the female member of the clutch when the latter is withdrawn. These plungers are so arranged that the clutch, being put into engagement, will gradually take hold, owing to the leather facing, and so that when the hold is complete the plungers (of which there are four or six, according to the size of the engine,) will drop into the nearest ones of the thirty-six holes drilled opposite to them in the flywheel web.

The speed-change gear is of the same direct-drive-on-top-gear type as last year, giving four speeds and reverse controlled by one lever and mounted on ball bearings. The only difference comes in the general strengthening of the gears and shafts.

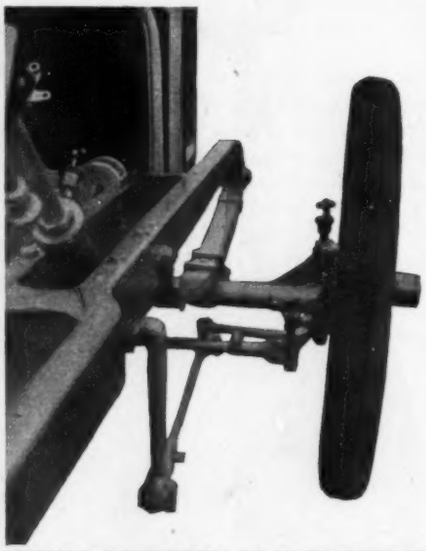
Both Live Axle and Chains.

In the 15-horsepower model the transmission is by propeller shaft and live axle. In the 25- and 50-horsepower models the drive is by side chains, as in the racing models of the past two years. Formerly the touring cars were all live-axle machines.

These changes from shaft to chain drive for the heavy models were not caused by any special defect of the shaft-drive system, but simply for the reason that with the extremely heavy and bulky closed types of bodies now required by the French buyers, the live axle had to be of such strength as to weigh considerably more than is the case for a side-chain car. With the 15-horsepower models this drawback does not exist. The chains used for the chain-driven car are identically the same types, make and size, that never gave any trouble with the 96-horsepower racing-car engines. They consequently should be well up to their touring work.

New Points About the Olds.

The accompanying engravings give some interesting views of the new four-cylinder 24-26-horsepower Oldsmobile touring car built by the Olds Motor Works, of Lansing, Mich. This machine was described in The Automobile of November 16 last, but only a photograph of the complete car was available. A number of interesting points are brought out in the detail photographs reproduced herewith. It will be noticed that in the photograph showing the under side of the car—a rather unusual view—the dust pan, extending from the radiator to the rear of the transmission gearcase, has been removed. When in place the motor and transmission are well protected from flying dust and mud. The spaces between the sub



STEERING CONNECTIONS OF FOUR-CYLINDER OLDS TOURING CAR.

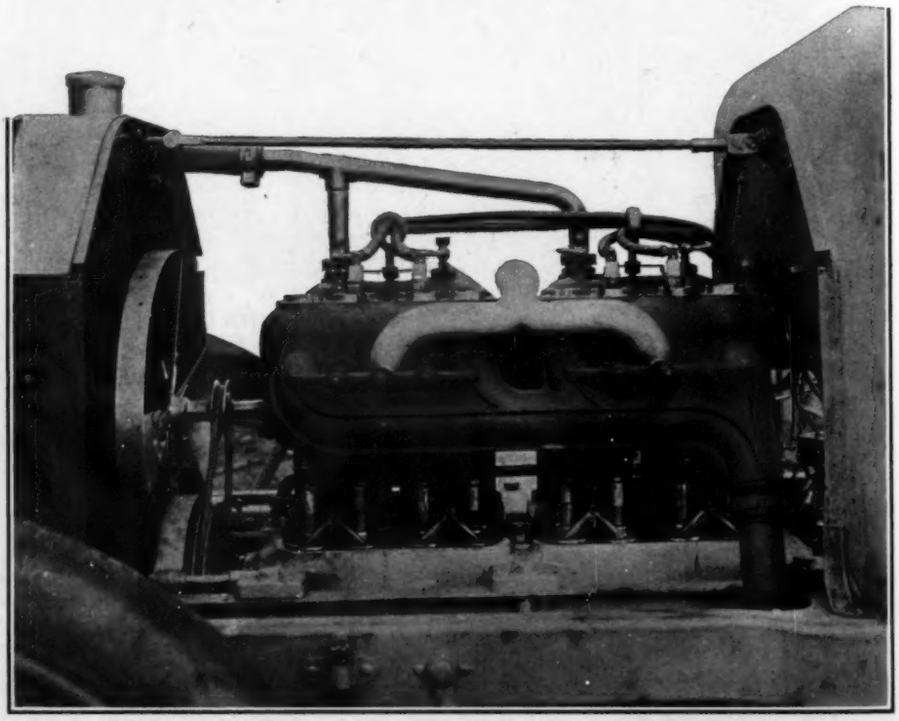
frames and the main frames are filled by permanently attached dust guards, which add materially to the strength of the frame as a whole.

The muffler, which is said to be exceedingly efficient in deadening the sound of the exhaust, is of unusual form, consisting of a cast-iron expansion chamber below and close to the engine, into which the exhaust gasses pass from the engine and are expanded; and the sheet-iron muffler proper, where the gases are cooled down before being allowed to escape into the atmosphere. A muffler cut-out allows the exhaust to escape directly into the air at the will of the driver. The long dustpan and the arrangement of the underbody of the car are said to make the car comparatively dustless. Tanks for kerosene for the lamps, and for lubricating oil, will be carried under the rectangular gasoline tank, though not shown in the photographs. The contents of the tanks may be drawn off through cocks at the sides of the car.

The emergency brakes, which are expanding rings working in drums on the rear hubs, are so connected up that the pull on the hand lever is divided equally between the two brakes. The equalizing device consists of a divided cross shaft; to each of the adjoining ends is attached a short lever, and to the end of each lever is attached the end of a yoke, the middle of which is pivoted to the rod that transmits the pull from the hand lever. The shaft is supported at the divided place by a short sleeve bolted to the end of a rod which extends back to the rear cross member of the frame. This arrangement takes all bending strain off the cross shaft, which has only the torsional strain to carry; the brace rod easily takes care of the straight pull. This brake interlocks with the clutch.

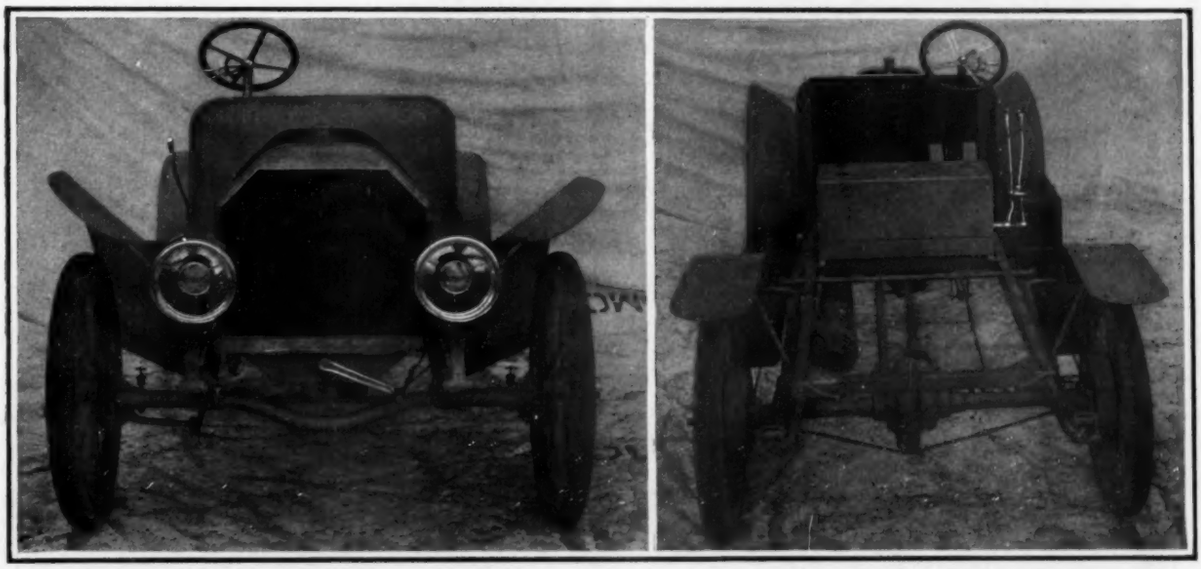
The curved hangers on the frame ends, to which the springs are attached, are of channel section, open side downward, and are forged with transverse ribs to give stiffness. Stiffening pieces are added where the hangers are rivited to the frames.

The photograph of the right-hand side of the front part of the car shows, among other things, the connections between the steering gear and the knuckles; the gear is of the thread and nut type. The swinging arms are long, and the connecting rod joints are fitted with spring buffers. It will also be noticed that the lubrication of the wearing parts is provided for by means of compres-



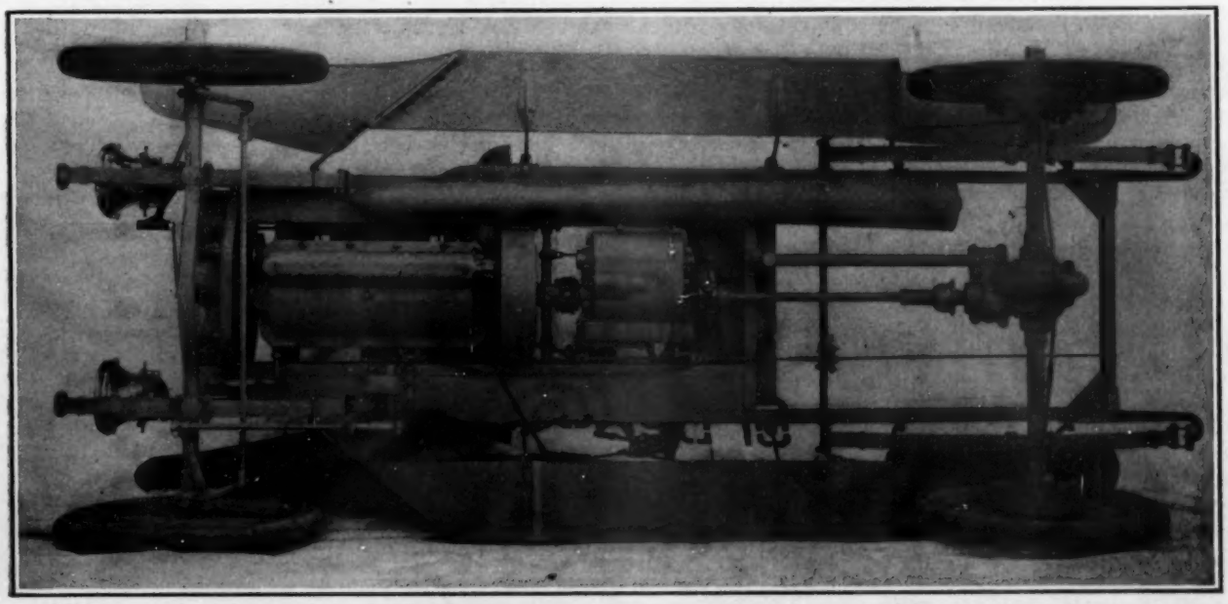
LEFT-HAND SIDE OF MOTOR OF OLDS TOURING CAR. NOTE BRIDGES HOLDING EXHAUST AND INLET PIPES IN PLACE AND PUSH ROD GUIDES.

OLDS 1906 MODEL FOUR-CYLINDER MOTOR-IN-FRONT TOURING CAR, BODY FITTED WITH COLLAPSIBLE HOOD.



FRONT VIEW OF OLDS TOURING CAR CHASSIS.

BACK VIEW OF OLDS TOURING CAR CHASSIS.



VIEW OF CHASSIS OF OLDS FOUR-CYLINDER TOURING CAR TURNED UPSIDE DOWN, WITH PROTECTING PAN REMOVED.

sion grease cups, so placed as to lubricate the thread and nut at the foot of the column, the pivots on the knuckles and the joints between the knuckle arms and the main connecting rod reaching across from one knuckle arm to the other. This rod is adjustable in threaded sockets fitted with pinching screws, so that the wheels can be lined up if they get out of parallel. Castellated nuts, split-pinned, are freely used. The hub caps are stamped with arrows showing the direction in which they must be turned when they are to be removed; this avoids confusion and the useless expenditure of strength when left-hand threads are used on one side and right-hand threads on the other.

On the engine, it will be noticed that the exhaust and inlet manifolds are both secured in position by the same yokes, four in number; a system of yokes is also used to hold the push-rod guides in their places in the crankcase; the guides are closely fitted, and this method holds them securely and permits their removal with ease and rapidity.

The radiator is supported on a bracket carried by the side frames, but is not itself attached to the frames; thus twisting strains caused by the springing of the frames are avoided. Under the crankcase of the engine will be noticed the lubricating oil tank; at the rear of the oil tank is a small gear pump which forces oil to the crankcase, main engine bearings and the transmission gearcase.

The high tension cables leading to the spark plugs are carried above the cylinders by metal brackets having holes through which the cables pass. The spark plugs are screwed into the screw covers over the inlet valves. All valves are mechanically operated, and are all on the left-hand side of the motor. Compression relief cocks, which may also be used as "dope" cocks, are placed in the cylinder heads.

The Oldsmobile touring car was designed by H. E. Coffin, chief engineer of the Olds Motor Works, who has devoted much time to the detail improvements on the car.

The new Oldsmobile appears to be simply and substantially constructed and to be free from "trappy" features or flimsy components, and there are a number of little things that will appeal to the automobilist. Among these are the leather guards placed between the inner edges of the front mudguards and the frame, thus protecting the front part of the car from the considerable amount of dirt and mud that usually finds its way inside the ordinary mudguards.

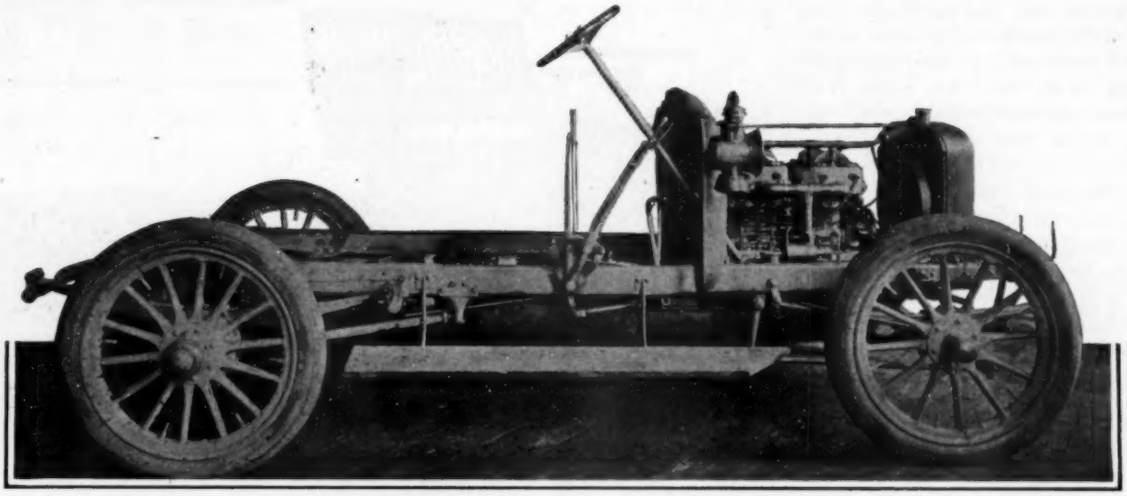
By way of recapitulation, it may be said that the car has four vertical water-cooled cylinders, cast in pairs with integral heads, jackets and valve chambers; leather-faced cone clutch; three-speed sliding gear transmission with selective lever control; shaft and bevel gear drive; pressed steel framing and tubular axles. Wheelbase is 106 inches and tread standard, or, if desired, may be had wider or narrower than the usual 56 inches. Weight, 2,200 pounds. As the photograph of the complete car shows, the body is of modern design and built on attractive lines.

Improvements in Ardsley Cars.

A number of important changes that make for greater efficiency and reliability have been made in the Ardsley cars for the season of 1906 by the Ardsley Motor Car Company, of Yonkers, N. Y. The frame and running gear, the engine and the transmission remain practically as they were in the 1905 model, as described at length and fully illustrated in the issue of THE AUTOMOBILE for January 7, 1905, but the ignition system has been changed, an entirely new carbureter has been adopted, the muffler is replaced by another of different type and is differently located, and the body has been slightly altered.

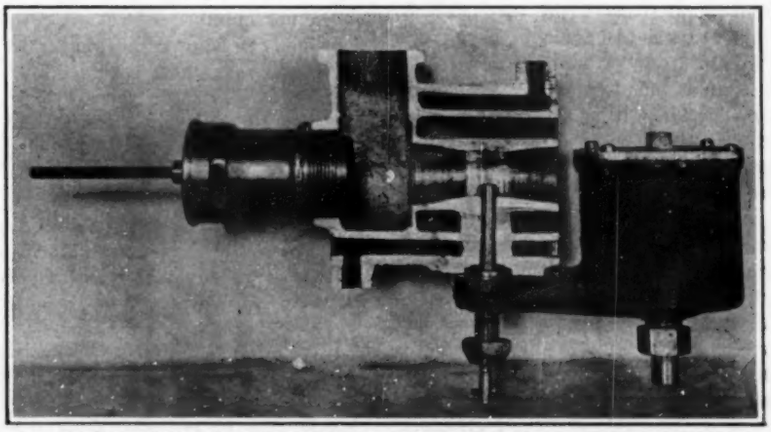
The Ardsley is assembled from standard high-grade parts, many of which are especially designed and made to order. The frame is of channel section pressed steel, the axles are tubular with removable live shafts from differential to drive wheels, the springs are semi-elliptic, 44 inches long in front and 48 inches at the rear, and are attached by trunnions to the side frames. The steering knuckles are of reversed Elliot pattern. The engine is of the vertical four-cylinder foreign type, the cylinders cast in pairs with integral water jackets. Inlet and exhaust valves are on opposite sides of the head in cages held in place by yokes. The camshafts are housed in the crankcase on either side and are driven by enclosed spur gears at the front of the motor. The stroke of the piston, which was formerly 5 3-4 inches, has been increased to 5 7-8 inches, but the bore of the cylinders remains 4 5-8 inches.

IMPROVED ARDSLEY FOUR-CYLINDER TOURING CAR FOR 1906, FITTED WITH CAPE CART HOOD.



SIDE VIEW OF CHASSIS OF NEW ARDSLEY TOURING CAR WITH MOTOR 4 5-8 BORE AND 5 7-8 STROKE.

In a further attempt to get more power out of the engine, a new type of carbureter designed by E. B. Blakely, general manager for the company, who was recently with the Haynes Automobile Company, of Kokomo, has been substituted for the old one. This is patterned after the type used in the later Mercedes, and is shown in cross-section in one of the photographs herewith. It has no automatic valves and no springs. The float-feed chamber is of the ordinary type, but the float is of spun brass with only one joint, which is on top where it is above the normal level of the gasoline. In this position the liability of the float to leakage is reduced to the minimum. The main vaporizing chamber is in the form of two cones with the small ends together, producing a slight stricture at the point where the spray nozzle enters the chamber. The object of this stricture is to maintain as nearly as possible a constant velocity of air at the gasoline nozzle to induce a regular flow of fuel. The air inlet is at the right-hand end of the chamber next to the float chamber. At the opposite end is the throttle, which is in the form of a sliding valve with an air hole cut in the bottom so that as the throttle is opened an auxiliary stream of air is allowed to enter the mixing chamber. A notable feature of the carbureter is that instead of taking warmed air into the carbureter to prevent it from frosting up, owing to the evaporation, the mixing chamber barrel is heated by using a shunt from the exhaust pipe of the engine. The hot gas circulates through the annular space next to the outer wall of the barrel. An inner annular space, open to the outer air at its right end, keeps the carbureter from getting too warm and the air for the mixture from being heated as it enters. Thus the charge of gas has little chance to expand before it enters the cylinders and so retains the maximum heat value per intake stroke of the piston.

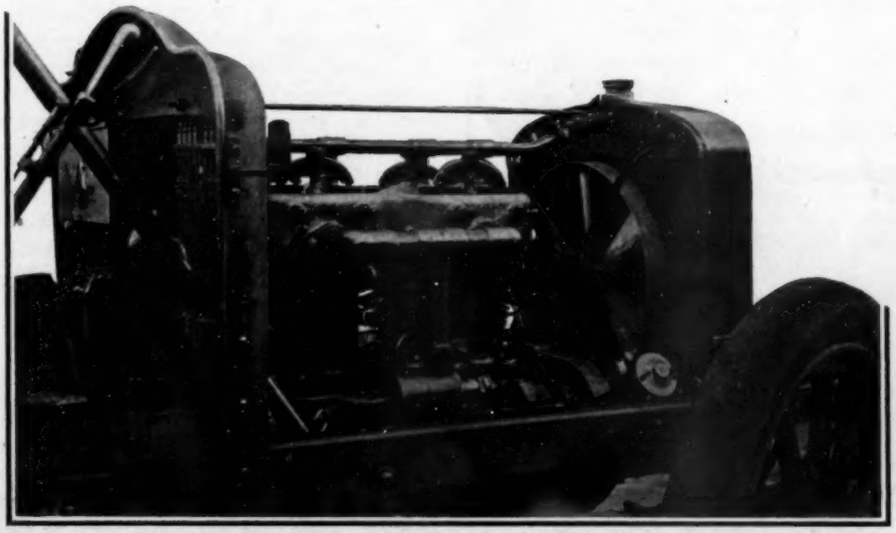


PHOTOGRAPH OF NEW ARDSLEY CARBURETER PARTLY IN SECTION.

This carbureter has proved so successful in the tests that have been made with it that the company is preparing to place it in the market independently of its Ardsley cars.

A new dash is another of the new features this year. It is of pressed steel, of the concave type, as seen in the engraving. A steel pan is also fitted under the car extending from the front of the engine to a point beyond the rear of the transmission case.

The lubricating oil reservoir is attached to the dash on the left side under the hood, where its contents is kept warm. A small lead from the exhaust pipe conveys pressure to the tank and forces the oil into the sight feeds on the concave side of the dash in front of the driver's seat. The first four of these feeds oil the four cylinders direct, the next three oil the main bearings



INLET SIDE OF ARDSLEY ENGINE, SHOWING NEW CARBURETER AND TIMER.

of the crankshaft, and the eighth feed oils the crank base. This insures positive lubrication of the cylinders both through direct feed and by splash from the base. The gear case bearings are lubricated by a large grease cup on the left side of the dash, one turn of which is said to give lubrication enough for 100 miles.

The high tension magneto ignition used last year has been abandoned in favor of the simple timer and coils, made by Lacoste. The timer is driven by bevel gears on the forward end of the inlet valve camshaft, which permits of placing the timer in a very accessible position.

The inlet manifold and the water manifold are made of copper tubing with brass terminals, rubber hose connections having been discarded.

A Mercedes type of muffler has been adopted and is now carried transversely at the extreme rear of the frame, instead of under the middle of the car, as heretofore.

Compression relief, instead of being operated from the dash, is now operated from the front of the car beside the starting crank—the logical place for it, as no one wants to run around from the front to the dash to shut it off after getting the engine started. The relief lever slides the exhaust valve camshaft longitudinally in its bearings to raise or lower the valves on their seats.

Another change is in the rear hub brakes, which, instead of employing wood against cast steel for friction now have cast steel sliding on cast iron, making the brakes much more positive and better wearing.

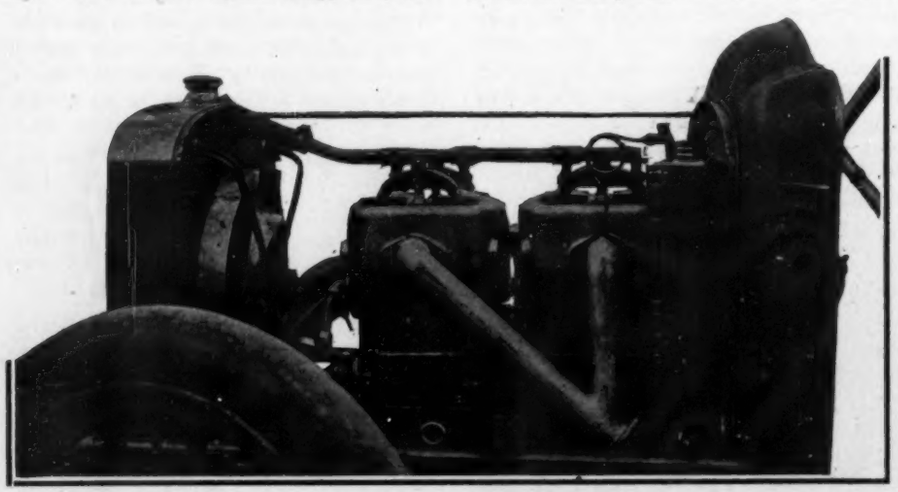
A larger body of the same style and design as last year is fitted to the chassis.

Plans have been made for the production of twenty-five of the improved Ardsley cars, and space has been taken at the New York show for their exhibition.

Kansas City Truck.

The truck illustrated herewith is a gasoline machine built by the Kansas City Motor Car Co., of Kansas City, Mo., for general commercial work. It has a maximum rated carrying capacity of two tons and a maximum speed of twelve miles an hour, and can be used as a platform or stake truck, or can be fitted with a top or an enclosed body. The side frames are of channel iron and the axles and springs are heavy and substantial. Drive is by side chains; the rear wheels are 38 inches in diameter and the front wheels 34 inches, with solid rubber tires. This truck will be finished in any desired color; the equipment of each machine consists of oil lamps, horn and a dash apron for the driver's protection.

TWO-TON GASOLINE PLATFORM TRUCK, BUILT BY KANSAS CITY MOTOR CAR COMPANY.



ARDSLEY ENGINE, SHOWING EXHAUST GAS SHUNT TO LUBRICATING OIL TANK.

PREPARING FOR NEW LICENSES.

PHILADELPHIA, Dec. 4.—Steps have been taken by the Automobile Club of Philadelphia to save its members from the annoyance of making a trip to Harrisburg to secure licenses, as necessitated by the new law, which goes into effect January 1 next. By agreeing to stand sponsor for each member the club has arranged for getting the coveted tags in a bunch. This move will obviate the delay that is sure to occur at the capital when the rush for licenses begins.

The new license blanks will, it is understood, be distributed this week, and the club is urging its members to secure and fill them out at once, in order that the applications may all be in hand ready for turning over to the new Automobile Bureau at as early a date as possible.

Just how the great majority of local automobilists who are "unattached" are to get their credentials without making personal trips to the capital has not as yet developed. They are hoping that some eleventh-hour arrangement may be made with the city officials whereby the latter may designate some one of the departments to receive applications and grant licenses.

MAGAZINE DISTRIBUTING BY AUTO.

INDIANAPOLIS, Dec. 4.—A successful experiment was made by the publishers of the *Hustlers' Magazine* in Indianapolis in delivering the city circulation of the publication by automobile. Whether or not the service will be continued has not been determined.

By the use of a Rambler runabout the publishers assert that nearly 2,000 copies of the magazine were delivered about the city in two days. Since the postal authorities required a two-cent stamp on each magazine when delivered within the city by mail, the saving in postage alone amounted to nearly $40.

Besides this economy, the publishers claim that better results were obtained than by mail delivery. The post-office did not forward nor return copies of the magazine mailed to persons who had moved, while with the automobile subscribers who had moved were located and the magazine delivered to them.

It is probable that an effort will be made to maintain the service through the winter, and, if weather conditions compel it to be abandoned, it is said that the idea will be taken up again in the spring.

Patents

Tilting Steering Column.

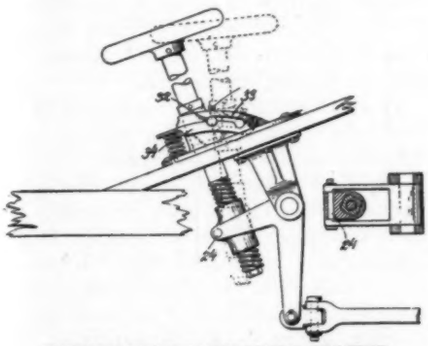
No. 804,375.—H. H. Buffum, of Abington, Mass.

This is a screw-and-nut steering gear in which the steering column can tilt about the pivot *24* as a center when the front wheels point approximately straight forward. The column is locked by causing the projecting pin *32*, attached to it, to engage the notches at the ends of slot *33* in the latching sector *34*.

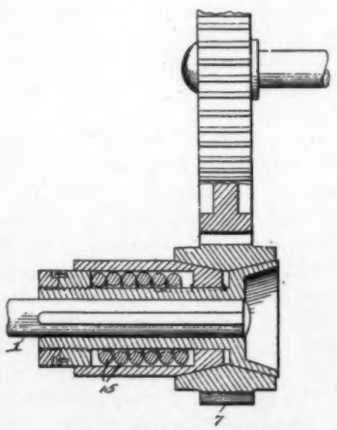
Yieldable Gear.

No. 804,778.—G. W. Smith, of Rockford, Ill.

This is a gear or pinion *7*, connected by



BUFFUM TILTING STEERING COLUMN.



SMITH SLIPPING GEAR.

the friction cones shown with its shaft *1*. The pressure of the spring *15* insures sufficient friction between the cones and the pinion to enable the latter to drive under ordinary circumstances, while permitting it to slip in case of shock.

Pneumatic Tire.

No. 804,613.—F. A. Magowan, of Trenton, N. J.

A tire having several inner tubes, arranged one inside the other, with valves similarly disposed. The outer air tube is first inflated, and when it receives a puncture the next is pumped up. Regarding the method of exposing the inside tubes for the purpose of patching, the specifications are a little indefinite.

Design Patents.

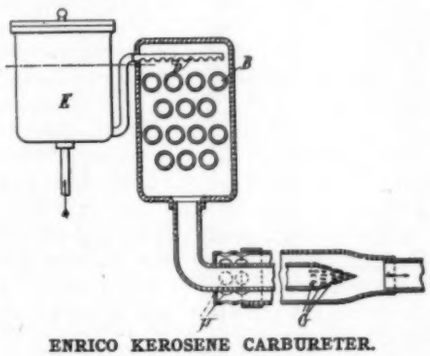
Nos. 37,670 to 37,674.—A. P. Brush, of Detroit, Mich.

A series of patented body designs for automobiles. They comprise a runabout, side-entrance tonneau, coupé and limousine.

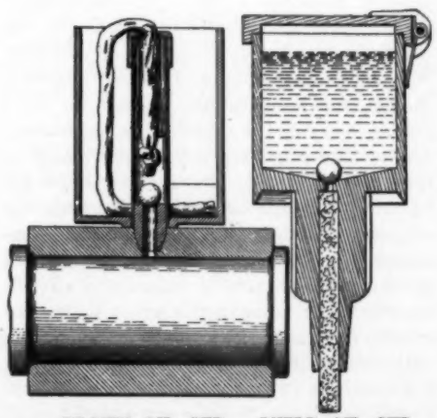
Kerosene Carbureter.

No. 804,589.—G. Enrico, of Torino, Italy.

In this carbureter the kerosene is gasified by heat before being mingled with the air. The float chamber *E* has spray outlets *D*, through which the kerosene is drawn by suction, the outlets being just above the normal level of the float chamber. The oil drops down on the pipes *B*, through which passes a portion of the exhaust gas from



ENRICO KEROSENE CARBURETER.



BROWN OIL CUP. LYTLE OIL CUP.

the engine and is thereby converted into vapor. The air intake is at *H*, and the kerosene vapor is taken up by the air as it passes through holes *G*.

Oil Cups.

No. 804,203.—G. W. Brown, of Boston, Mass.

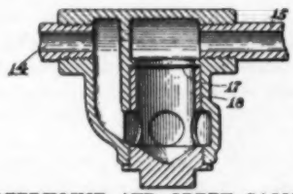
No. 804,612.—H. H. Lytle, of Beaver, and E. D. Cawley, of Allegheny, Pa.

These two oil cups are similar in that the outlet from the cup is in each case closed by a ball, which tends by gravity to find the position shown and is displaced enough by the vibration of the vehicle to permit the passage of oil. In the one device a wick feed is used, and in the other the oil pipe has a felt or wick filler, which prevents the oil from going through too fast. Although intended by the inventors for railway use, they seem to be equally adapted to automobiles.

Gasoline Strainer.

No. 804,284.—H. D. Waterhouse and F. W. Green, of Quincy, Mass.

A device for separating water and sediment from gasoline. Gasoline enters by the



WATERHOUSE AND GREEN GASOLINE STRAINER.

pipe *14* and descends to the pocket below, where water and sediment heavier than the gasoline collect. The gasoline then rises and passes through the screen *17* and out by pipe *15*. The annulus *18* can be unscrewed for the removal of water and sediment, the screen *17* coming out at the same time.

VERMONT REGISTRATIONS.

An up-to-date list of licenses issued for automobiles and motorcycles, just sent out by Frederick G. Fleetwood, of Morrisville, Secretary of State for Vermont, shows that 494 licenses have been issued in that state. The numbers run from 1 to 499, inclusive, but licenses corresponding with five of the numbers were not issued

Statistics issued by the same authority about April 15 showed 214 licenses, which, by comparison with the latter list, shows an increase of 280 during the past summer, not all of which are new, however, as the new state law did not go into effect until April 15. Of the 494 machines listed 23 are motorcycles.

The Mercedes car, owned by the late Clarence Gray Dinsmore, has been bought by H. Weingand, a Dusseldorf sportsman, who will send the car to the start in European races as frequently as possible next year. Mr. Dinsmore's well-known chauffeur, Werner, the international driver, has just received the Gold Crown Order medal from the German Emperor for driving him in the recent army maneuvers.

Most of the big British automobile concerns have had a successful year. The Argyll and Daimler firms are paying big dividends, and many others have converted an adverse balance into a profit. The French Darracq Co. has been floated on the English market recently, and the required capital, totaling $3,200,000 was easily obtained. It is rumored that some of the Darracq cars will be manufactured at a new factory south of London.

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Sources of Fuel Supply. Government statistics of the world's production of petroleum recently published show that the output of crude oil and of refined products is steadily increasing, the total in 1904 being 219,162,501 barrels, of 42 U. S. gallons. An analysis of these bulk figures shows that, contrary to popular belief, the United States maintains its actual and comparative lead in the quantity of output, its share forming 53.42 per cent. of the world's total in 1904, as against 51.46 per cent. in 1903 and a less percentage in the previous year. Russia, on the contrary, shows a diminishing percentage of the total, for though she produced more oil in 1904 than 1903, her percentages were 35.82 and 38.73 respectively.

The same relative positions are shown in the tabulation by countries of the world's production of refined products, which for all countries is, approximately, the enormous total of 3,025,687,098 U. S. gallons. Of this the United States contributed 73.1 per cent. and Russia only 18.7 per cent. In other words, the United States produced 2.72 barrels of refined products last year for every barrel produced by all other countries in the aggregate.

Automobile interests are peculiarly interested in this question of petroleum output—not so much the individual user, perhaps, as the manufacturer. In this connection, it is not unusual for the autoist to consider the output only in connection with the supply of fuel—gasoline. There are other uses of petroleum or its refined products, however, which are quite important to the trade. For engine lubrication and for the solution of the dust problem on country roads, mineral oils are essential. The high cylinder temperatures of the explosion motor prohibit the use of animal or vegetable oils in the lubrication of the piston and walls, and though other fluids may be used for fuels, there is no known effective substitute for the petroleum lubricants. In the making of roads the beneficial use of a petroleum dressing will be recalled by those familiar with the California roads so treated, or with the practical demonstration on the Vanderbilt cup courses in Long Island.

However, owing to the quantity of gasoline used as fuel in automobile motors, and the fact that it forms only a comparatively small percentage of the bulk of crude petroleum, and that of the finer grades also, the question of fuel supply is a more serious one than that of the other petroleum uses, so far as automobilists are concerned. Kerosene as a fuel differs only in degree and not in kind, as it is also a product of crude petroleum, though a more plentiful one. Bulk figures are apt to be misleading unless it is borne in mind that the area of country in which gasoline producing oils are found is restricted and that the new and large areas of oil land in Texas and California do not materially add to the visible or estimated supply.

Alcohol as a fuel has occupied much attention, especially in those countries which do not produce mineral oils, and for stationary work it seems a valuable substitute for gasoline or naphtha. Its use in the automobile, however, cannot be said to have gotten beyond the practical experimental stage. The promoters of the movement to remove the internal revenue tax from denaturized alcohol—alcohol fit for fuel, but not for drinking—seek to enlist the cooperation of the automobile interests, and the Automobile Club of America is already informally on record in favor of the movement. It is asserted by the tax repeal advocates that more gasoline is now used in the operation of stationary internal combustion farm engines than by automobilists, and that, were the tax removed, the farmer would switch over to the new fuel, thus adding enormously to the available supply of gasoline for automobiles without a corresponding increase in the supply of high-grade crude petroleum.

It is entirely probable that the farmer would prefer to use a fuel made out of farm products, but would it necessarily follow that the oil refiners would not cut down the output of gasoline to the level of the decreased demand? Is it not an extravagant supposition, also, that the Standard Oil Company, which controls the market for petroleum products, might engage in the production of alcohol for commercial uses were it satisfied that the supply of gasoline was becoming exhausted? It could not, of course, control the manufacture of alcohol, but its magnificent system of distribution would give it a lead over all other competitors.

There seems to be nothing harmful to automobile interests in the removal of the tax on denaturized alcohol, and it would give American mechanical genius an opportunity to at least keep abreast of foreign motor construction. In the export trade there is likely to be an increasing demand for alcohol motors in those countries in which this fuel is plentiful and untaxed.

Six Cylinder vs. Four Cylinder. Though the six-cylinder gasoline motor is by no means a novelty, the fact that six-cylinder cars are being manufactured by prominent manufacturers at home and abroad as regular 1906 models has brought this type of engine to the attention of the automobiling public more forcibly than ever before, and much discussion pro and con is being indulged in.

Personal preference will probably be an important factor in choosing between four-cylinder and six-cylinder engines. Manufacturers of automobiles of the better class have succeeded in producing thoroughly reliable machines; this most important object attained, they are free to turn their attention to refinements such as smooth running and ease of handling, and the modern six-cylinder engine is an indication of the efforts being made in this direction. The reliability of a motor is not necessarily impaired by increasing the number of cylinders, for no complications are involved; the parts already in use are merely duplicated. It is, of course, true that with six cylinders the opportunities for leakage and loss are greater than with four, and the increased number of bearings and other frictional points might be expected to increase the frictional losses in proportion to the power developed. On the other hand, the power impulses are lighter and more evenly distributed, and therefore the moving parts can be made smaller and lighter and the bearings will share in the general reduction of size. The flywheel of a six-cylinder engine can be made much lighter than the flywheel of a four-cylinder motor of the same power, so that the crankshaft of the six-cylinder motor is relieved of considerable strain from this direction.

A point that has been raised against the six-cylinder engine is that a greater proportion of heat is necessarily lost through the cylinder walls than in the four-cylinder motor. It is impracticable, however, to run any explosion motor without abstracting sufficient heat to keep the temperature of the cylinder down to a point where the lubricating oil will be effective; and the difference in the amount of heat lost in the two types of engine under discussion can hardly be sufficient to seriously outweigh the advantges gained by the flexibility in operation.

The six-cylinder car has the advantage, due to its constancy of torque, of being able to run very slowly on the high gear and of running at all speeds with great smoothness and lack of vibration. When the car is to be used to any great extent where frequent and quick speed changes must be made, as in heavy traffic, it is undoubtedly an advantage to be able to dispense with the trouble and delay occasioned by shifting gears either to increase or decrease speed, and the smooth running of the engine, especially at slow speeds, is certainly conducive to comfort. The user must therefore decide whether the ease of handling and the smooth running of the six-cylinder car will be of sufficient importance to him to outweigh any possible disadvantages due to the increased number of parts.

In the matter of fuel consumption it is not likely that there is sufficient difference between the two types of motor to call for any serious financial consideration on the part of the user, though the subject is of considerable technical interest. More important, from the user's point of view, is the fact that six cylinders require a longer hood than four cylinders, which means that the passenger space of the car must be shorter, or else the wheelbase must be longer than in a four-cylinder car of the same power and capacity. While a moderately long wheelbase is desirable, from the standpoint of comfort and easy riding, excessive length makes the car difficult to handle on sharp turns and in traffic.

The fact that the six-cylinder motor has been considered worth special efforts on the part of well-known manufacturers would indicate that they believe it to possess advantages sufficient to outweigh the additional cost of this construction. The automobilist will doubtless be guided by the conditions under which the car is to be used in deciding whether the extra cost will be compensated for by the smooth running and ease of handling of the six-cylinder car.

The coming Paris Salon will have been shorn of much of its glory by the fact that all the 1906 French models, with but one or two exceptions, have already been shown at Olympia in London. Many foreign automobilists were interested spectators at the London show, and the generally expressed opinion was that the British product had made great advancement during the past year.

The Motor Union of England is endeavoring to serve the industry a good turn by proposing that in cases of dispute between automobilists, recourse shall be made to arbitration, thereby preventing the matter going to the law courts. This should be of great benefit to all parties concerned, and the proposal has been well received by the trade.

The automobile used by H. Deeds, the **Lincoln, Kan., rural mail carrier, probably won't dare to break down. It is against the law to delay the United States mail, you know.**—Kansas City *Times*.

Megargel and Fassett Leave 'Frisco for New York.

San Francisco, Nov. 25.—Megargel and Fassett, in the Reo *Mountaineer*, left this city last Tuesday, November 21, for Los Angeles, on their return trip across the continent by the southern route to New York. They were escorted outside of the city limits by a number of enthusiasts and newspaper men in automobiles.

Their car has stood the 4,500 miles of hard travel very well; even the varnish looks good and does not in any way give the impression of a machine that has fought its way through Nebraska mud and the almost impassable roads of the Cascade mountains. Yet, unquestionably, from the time the tourists leave Los Angeles their past troubles will seem small by comparison with those of the American desert. For four days they will be out of reach of water and beyond the assistance of their fellow men. The prospect is not alluring, but it is possible that they may find this route to be best for the proposed government transcontinental highway for which they are surveying for the American Motor League.

A road across the continent, built and sustained by the government, with easy grades, good bridges and a fine bed, would mean much to the automobile industry, as well as to the country through which it passes. The day is not distant when a great portion of the Great American Desert will be settled; all it needs is water, and there is water that will some day be turned over this arid plain, whose agricultural possibilities are almost unlimited, as the soil is of such a character that it will grow anything that flourishes in a tropical climate.

Palo Alto, Nov. 21.—The run from San Francisco to Palo Alto is one of the most interesting an easterner has ever made with an auto. Our car took the run around the base of a high hill, the bay on one side and a cliff on the other. The curves were sharp and we were meeting other automobilists and passing rigs all day, but the scenery was magnificent. After finally leaving the vicinity of the bay, the road ran between rows of tall tropical trees—Fassett said they looked like cocoanut trees, but a native informed us they were gum trees. At any rate, they furnished shade and turned what would otherwise have been an ordinary stretch of exceptionally good roadway into a shady avenue that would have answered for the driveway to the palace of a king.

The roads here are oiled and almost entirely free from dust, while they are so level that we have not used our low speed all day. I have been informed that the roads between San Francisco and this place are in reality the poorest we will encounter in the entire 500 miles to Los Angeles. If this is true, California roads have not been overpraised.

Although the month is November, the trees are green, fruit is ripening in the orchards, and flowers, both wild and cultivated, are blooming everywhere. Truly, California, with its fine roads, excellent hotels and delightful climate, is an ideal country for the automobilist to tour in during the winter months. What Arizona and New Mexico will bring forth remains to be seen.

Few makers of automobiles, unless they have actually driven in the city of San Francisco, realize the grades that are to be found there. Almost every street running through the city has from one to five heavy grades included in its length. The street on these grades (in some cases 22 per cent.) is usually paved and the road well kept, making it possible for a powerful hill-climbing automobile to mount, but unless the brakes are of very superior character the descent is extremely dangerous.

I was greatly impressed with the number of automobiles in use in San Francisco. All kinds and makes are found, and two manufacturers are building cars there. Motor bicycles, too, are in great demand, and the city and surrounding country are sprinkled with loud puffing machines of various makes.

Palo Alto is one of the most beautiful towns I have ever been in, and it is a good town for automobiles. It is the seat of the Leland Stanford University. One has to see the buildings and grounds and note the college spirit that prevails before he can fully appreciate the full value of Senator Stanford's gift to the State of California. We rode through the grounds here this afternoon, and visited the chapel, listening to the wonderful pipe organ.

Our coming had been looked forward to by the local automobilists for several days, and our reception was most cordial. This is the city that had upwards of 200 automobiles parked in the vicinity of the athletic field when Stanford University played football against the University of California two weeks ago.

Somewhere between 'Frisco and Palo Alto this afternoon my suitcase was lost off the machine, and no amount of telephoning has succeeded in locating it. Besides all my clean clothing and business suit, it contained a lot of papers, notes, maps, and my barometer, compass, films for the camera, revolver, and other necessary articles. So I feel much like the fellow that went in swimming and had his clothes stolen.

Percy F. Megargel.

Calvin W. Hendrick, chief engineer, and Samuel M. Gray, Rudolph Hering and F. Stearns, consulting engineers, who are to build Baltimore's great sewage system, are using a Maxwell automobile in going over the ground in Anne Arundel County, where the filtration plant will be erected. Neither e'ectric line nor railroad goes near the vicinity at present.

Cleveland A. C. Road Sign and Guide Book Work.

CLEVELAND, Dec. 4.—The Cleveland Automobile Club, through Assistant Secretary Charles Marvin, is working out a most progressive campaign in the placing of guide posts and the publication of road maps and bulletins showing the most desirable roads and the condition of highways throughout Ohio. It will soon begin the work of erecting sign posts all along the main route across northern Ohio from Fremont to the Pennsylvania state line, a distance of about 150 miles. The thorough way in which this work is being carried out is shown by the fact that 150 posts will be erected on this route, or an average of one to the mile. The signs are placed on independent cedar posts eight feet high and are of heavily enameled sheet steel with blue enamel letters. Arrows indicate the direction to the important cities.

The Toledo Automobile Club has arranged to erect signs along this route from Fremont west to South Bend, while the Automobile Club of Buffalo already has placed similar signs along the route in northern New York state. The signs and posts cost $1.15 each and the Cleveland club pays for the erection and maintenance of the posts in its district. It is the intention to put up another lot of 150 next year on the routes leading to Pittsburg and Columbus.

The Ohio road map which Mr. Marvin is preparing will be the most complete and accurate publication of its kind ever produced, it is claimed. To secure the needed data has been a long and tedious undertaking. Mr. Marvin first wrote to editors of newspapers in all important towns in the state asking for the names of three or four enthusiastic operators in each vicinity. In many cases it required two or three letters to secure even this information. Then personal letters were written to all the persons named asking for detailed information as to roads and routes in all directions out of the town. These elicited a great mass of valuable information, as few failed to reply. Mr. Marvin has personally covered a number of the main routes, and also secured much valuable information from persons who have taken long tours.

Some of the data secured in this manner was remarkably complete and accurate. For instance, from William W. Morrison, a civil engineer at Bryan, O., he received a blueprint drawn to scale and blocked out one-fourth inch to the mile with detailed information as to the route from South Bend, Ind., to Toledo, a distance of 130 miles on the main highway from Chicago to the East. This map is keyed to designate every feature of interest. It shows the character of the road with alternative roads to be used in wet weather, gives locations of hills and curves, points of identification such as churches, schoolhouses, etc., telephone lines and stations of both Bell and Independent systems, steam and electric lines, hotels and restaurants with reference as to their character and charges, and the location of garages, gasoline supply stations, charging stations, etc.

The club rooms of the Cleveland Automobile Club have recently been refinished and renovated and their appearance has been much improved, the rooms being better lighted than heretofore. A large grill room will be completed and furnished this week, and the present grill room will be fitted up as an office, cloak room and card room, giving the club about half again as much space as it had before.

PRIZES FOR GOOD ROADS.

New Jersey Club Proposes Cash Inducements for Supervisors—Club Election.

ASBURY PARK, N. J., Dec. 4.—Monmouth county roads, long considered by automobilists as among the best in New Jersey, will be kept up to their present high standard if the plan of the Monmouth Automobile Club, with headquarters in this city, succeeds. At the annual meeting of the club last week C. R. Zacharias, one of the members, stated that he had urged the Asbury Park Board of Trade to offer prizes of $100, $50 and $25 to the three road supervisors of the county having the best kept roads, the prizes to be an incentive to the supervisors to keep the roads under their charge in the best possible state. The club voted to give the board of trade $25 toward the prizes.

The committee on tours and contests was authorized to erect danger signs wherever necessary in the county as warnings of bad crossings or other dangerous places. The club has already caused finger-boards indicating the direction and distance to different places to be erected at crossroads all over Monmouth county and will now turn its attention to the danger spots.

Another matter that came up was the habit that locomotive engineers have of failing to sound the whistle or bell for street crossings. The secretary was instructed to look up the law covering the subject, and, if a statute which provides for blowing the whistle or ringing the bell at the approach to a crossing can be found, to notify the heads of the railroad companies operating in the county of the negligence of engineers.

The annual election of officers was held and resulted as follows: President, W. N. G. Clark: vice-president, J. P. Hickman; and secretary-treasurer, George W. Pittenger. Through its connection with the Associated Automobile Clubs of New Jersey the Monmouth A. C. has become affiliated with the American Automobile Association.

PLANNING AVALON CLUBHOUSE.

PHILADELPHIA, Dec. 4.—The Avalon Automobile Club of this city is working on plans for a Colonial clubhouse to be erected at Avalon beach on an island off the New Jersey coast. The house is to contain fifteen rooms, of which about eight will be sleeping rooms for members, the others comprising library, dining-room, grill room, kitchen and others. Plans for a garage will be made as soon as the clubhouse plans are finished.

At present Avalon is reached only by the West Jersey and South Shore railroad, but it is almost certain that a turnpike will be built within a year to connect the island with the mainland at a point near Cape May Court House.

The beach on the island is about eight miles long, of which seven miles is almost perfectly straight, the curve being inward from the ends, thus forming a course well suited for auto racing at low tide. The beach will average from 250 to 300 feet in width and is very hard; a hack loaded with five persons leaves a barely perceptible impression in the sand.

NEWS NOTES OF THE CLUBS.

SOUTH HAVEN, MICH.—An automobile club has been organized here, practically all the local owners being included in the membership list.

CINCINNATI, O.—Members of the Automobile Club of Cincinnati enjoyed a smoker on the night of December 2 at the Business Men's Club. Several prominent speakers addressed the members on timely topics.

NEW YORK.—An interesting talk on alcohol as a fuel for explosion motors was given before members of the Automobile Club of America by Whidden Graham at the regular weekly meeting of the club. The speaker, who had made a study of his subject, gave statistics regarding the production of alcohol and gasoline and told of the efforts being made to interest the farmers in the proposal before Congress to remove the tax on denaturized alcohol. Mr. Graham especially advocated alcohol for commercial vehicles, as he said that motors would have to be made slightly larger and heavier for equal horsepower. Tests had shown, he said, that a car can be started on alcohol in half a minute.

BROOKLYN.—The annual election and banquet of the Long Island Automobile Club was set for Wednesday, December 6. Nominations for officers were as follows: President, Alfred Wilmarth; vice-president, Edwin Melvin; treasurer, Charles J. Edwards; secretary, Walter C. Pierson; governors to serve for two years, Frank G. Webb, Dr. C. B. Parker and John H. Manuel, Jr. Prizes were to be presented for the club contests conducted during the past year as follows: President's cup to member bringing in largest number of new club members, to A. C. Pinney or A. R. Pardington, who were nearly tied; governor's cup to member recruiting next largest number; economy contest cup, Dr. C. B. Parker; Mackay meandering cup, for driving in greatest number of states, Charles J. Ed-

AMERICAN AND FOREIGN AUTOMOBILE SHOW AND RACE FIXTURES.

Domestic.

Jan. 13–20—Open Automobile Show, Sixty-ninth Regiment Armory, New York; A. C. of America.
Jan. 13–20—Licensed Car Show, Madison Square Garden, New York; A. L. A. M.
Jan. 22–27—Ormond-Daytona Beach Tournament, Florida; Florida East Coast Auto Assn.
Feb. 3–10—Chicago Fifth Annual Automobile Show, Coliseum Bulding; S. A. Miles, Mgr.
Feb. 5–10—Washington Automobile Show; Washington Auto Dealers' Assn.
Feb. 12–17—Detroit Automobile and Sporting Goods Show, Light Guard Armory; Tri-State Automobile and Sportsmen's Association.
Feb. 17–24—Cleveland Automobile Show; Cleveland Auto Dealers' Association.
Feb. 20–Mar. 8—National Auto Boat and Sportsmen's Show, Madison Square Garden, New York.
Mar. 3–10—Philadelphia Automobile Show.
Mar. 13–20—Buffalo Automobile Show, Convention Hall; Buffalo Auto Trade Association.
Mar. 16–23—Boston Automobile Show; Boston Automobile Dealers' Association.

Foreign.

Dec. 8–24—Paris Automobile Salon; A. C. of France.
Dec. 11–16—International Tourist Congress; Automobile Club of France, Paris.
Jan. 13–25—Belgian Automobile Show, Brussels.
Jan. 17–21—Indian Reliability Trials, Bombay to Mahableshmar; Motor Union of Western India.
Jan. 26–Feb. 3—Crystal Palace Automobile and Motor Show.
Feb. 7–18—Berlin Automobile Show.
Feb. 3–18—Turin, Italy, Automobile Show.
Feb. 9–17—Liverpool Automobile Show.
Mar. 24–31—Cordingley's Fourth Automobile Show, Agricultural Hall, London.

wards; Adams attendance award, for presence at largest number of club meetings, F. B. Stephenson, C. J. Edwards or A. R. Pardington; Mersereau mileage trophy and David J. Post prize for largest number of miles recorded.

TO OIL CUBAN COURSE.

Havana Council Appropriates $5,000 to Improve San Christobal Road.

HAVANA, Nov. 29.—The city council of Havana has appropriated $5,000 toward the expense of oiling and preparing the San Christobal course for the international races to be held here early next year. This and the promise of an appropriation of $2,000 by the provincial council for the same purpose, practically assures the holding of the big races during the late winter or early spring. It is estimated that $7,000 will properly prepare the course, as the roads are in generally excellent condition and do not require much work beyond the oiling to lay the dust.

Dr. Honore Laine, secretary of the Havana Automobile Association, says he has no doubt that the international tournament to be held here will be the largest and most important ever held in the South, not excepting previous Florida meets. Already sixteen owners of high-speed automobiles have signified their intention of attending and participating in the races, and it is believed by Dr. Laine that before the time set for the races he will have received many requests from other automobilists to enter their names. He thinks also that with the encouragement of the merchants, hotels and others of the city who would especially profit by the holding of the races, prizes of a kind worthy of the occasion will be offered, and that many visitors from other countries will be induced to come to Havana.

Ramon Mendez, one of the leading lights of the automobile racing association, who took an active part in the races last year, has resigned from the secretaryship of the association and has been succeeded by Dr. Honore Laine, who numbers his clients by the thousands and has considerable influence.

It is proposed to have the long race start nearer Havana next year, at the site of the Columbia camp, where the American troops were quartered. From there is a long expanse and sweep of excellent road which can be seen for some distance. There is an old ruin, a relic of the war, which would hold the waiting cars with their attendants.

If Albert Clement can obtain a leave of absence from the French army, it is expected that he will cross the Atlantic early next year to compete in the 200-mile road race over the Havana-San Christobal course in Cuba next February. E. J. Conill, of Havana, who has been in New York for several weeks, has secured, through the Sidney Bowman Automobile Company, the 100-horsepower Clement-Bayard racing car that was built for the French elimination trials of last June and driven by Clement in that event and in the subsequent Gaillon hill climb. This car will be shipped direct from Paris to Havana, where it is expected to arrive on January 10. With it Mr. Conill will defend the Havana Municipal Cup, which was won last February in his 60-horsepower Mercedes by Carricaburu over the 160-kilometer course.

Mr. Conill, who is president of the Havana Automobile Racing Association, the organization under whose auspices the Cuban automobile tournaments are conducted, is very anxious to secure the handsome cup again next year, and believes that with this car and young Clement to drive it, he will stand a good chance.

AUTO SERVICE IN MICHIGAN.

DETROIT, Dec. 4.—It is stated that an automobile company in this city is preparing for a great spread in business and intends to put the auto squarely into competition with the railroads, trolley lines and livery stables. The statement is made that the company is now preparing to operate automobiles out of Detroit to the suburban towns and that if the scheme works the plan will be tried in other places. Kalamazoo is booked for an experiment if the company starts its system. Naturally, the progressive and populous southwestern part of the state would afford a fair test. The promoters are R. C. Thompson, of Louisville, Ky., T. E. Hardman, of Chicago, and F. C. Wirschman, of Detroit.

RECENT INCORPORATIONS.

The Roseville Motor Co., Newark, N. J.; capital, $25,000. Incorporators: E. H. Mott, Henry Tetlow, George M. Barner.

Triumph Motor Car Agency, New York; capital, $15,000. Directors: C. E. Zimmerman, O. C. Carpenter, H. P. Heath.

Blackall & Baldwin Co., New York; to manufacture electric motors; capital, $50,000. Directors: A. S. Adams, W. H. C. Lee and F. S. Blackall.

Prospect Construction Company, Brooklyn, N. Y.; to conduct a garage; capital, $6,000. Directors: W. C. Damron, H. B. Hill, J. W. F. Ehlers.

Penn Auto Supply Co., Boston, Mass.; to deal in auto supplies; capital, $10,000. President, H. W. Knights; treasurer, W. J. Foss; clerk, A. W. Knights.

McKinley Motor Car Co., Rochester, N. Y.; manufacture motor cars, etc.; capital, $20,000. Incorporators: S. R. Snook, A. H. Sowers, E. H. Lapp, G. H. Smith.

American Generator Co., New York; to manufacture vehicles and motors; capital, $100,000. Directors: H. C. Cryder, Townsend Morgan and W. M. Seabury.

American Continental Caoutchouc Company, Chicago, Ill.; capital, $10,000; manufacturing tires. Incorporators: Harrison Musgrave, J. B. Gascogne, J. H. S. Lee.

The Fort Worth Automobile Co., Fort Worth, Tex.; capital, $10,000. Incorporators: M. R. Sanguinet, A. B. Wharton, C. D. Reimers, W. W. Sloan, Jr., F. R. Hedrick.

Macnaughton & Du Broy, Inc., Buffalo, N. Y.; manufacture motors, engines, automobiles, etc.; capital, $10,000. Incorporators: James Macnaughton, F. L. Du Broy, M. D. Ashford.

The Turbine & Locomotive Car Company, Newark, N. J.; capital, $500,000. Incorporators: Stacey Wilson, Robert J. Keith and A. G. Mabee. The company is to manufacture engines and vehicles of all kinds.

The Correspondence School of Automobile Engineering, New York City; instruction in automobile engineering; capital, $30,000. Incorporators: R. E. Olds, R. M. Owen, Victor Lougheed, R. H. Montgomery.

The Babcock Electric Carriage Co., Buffalo, N. Y.; manufacturing automobiles, etc.; capital, $100,000. Incorporators: Frank A. Babcock, Frank L. Bapst, Harry Yates.

Calvert-Zusi Auto Co., Newark, N. J.; general automobile business; capital, $20,000. Incorporators: C. S. Calvert, L. B. Zusi, Edward Zusi.

New Detroit Company to Build Air-Cooled Cars.

DETROIT, Dec. 4.—Under the name of the Aerocar Company, a new concern has been organized in this city for the manufacture of automobiles to be called Aerocars, doubtless from the fact that they are to be driven by air-cooled motors. A large factory that is to be completed in forty days is already half completed; an initial output of 500 touring cars for 1906 is contemplated, and space at the New York shows has been taken for the display of the new machines.

Details of the personnel of the company and the origin of the car that is to be built are just now available for publication. At the head of the new company is Alexander Y. Malcomson, a wholesale and retail coal dealer owning large establishments in Detroit and Toledo. The Ford Motor Company, of which he is still treasurer and a director, was financed by Mr. Malcomson. M. O. Reeves, of the Reeves Pulley Company and Reeves Machine Company, of Columbus, Ind., will manufacture and supply the engines, of which he is the inventor. He has built for his own use several automobiles embodying ideas of his own. His first car, driven by a pair of vertical two-cycle gas engine cylinders, was built in 1898. Two years ago he evolved the Reeves air-cooled four-cycle motor, which he has tried out in two sizes, each having four four-cycle vertical cylinders arranged tandem, with a cooling fan in front.

One of the officers of the new concern is Walter G. Morley, formerly purchasing agent and advertising manager of the Olds Motor Works, with which he was associated for seven years up to the time the Detroit plant of that company was removed to Lansing, when Mr. Morley remained in Detroit because of his other interests here.

The mechanical superintendent will be E. J. O'Hagan, for seven and a half years with the Winton Motor Carriage Company, of Cleveland, and for the past year connected with a large concern in the East building air-cooled automobiles. Chief draughtsman will be C. Pfahler, for the last three years employed by automobile manufacturers in the East. H. H. Thorpe, who retires from a similar position with the H. H. Franklin Manufacturing Company, of Syracuse, will be the general sales agent.

The factory that is being erected is located at Mack avenue and the Michigan Central Belt Line railroad. It is more than 400 feet long, facing on the railroad, and when completed will practically occupy the entire block. Already the power plant is almost ready for the roof, and the company feels confident that the factory will be in full operation early in January. It will be modern in every respect, with up-to-date automatic machinery and electric drive. The building is of mill construction, with steel columns and girders. The main building will be divided into four sections by brick fire walls extending to the roof. The power plant will be in an annex at one end, where will be installed a 250-horsepower engine. The general offices and operating departments will be on the ground floor, and the drafting room will be on the second floor in front. Two electric elevators, 11 by 18 feet, will communicate with both floors. There is to be an automatic fire sprinkler system. Contracts for the construction of the plant specified that it was to be finished in forty days, and in the first five days 1,800 feet of foundation walls was laid.

SHOW TELEPHONE EXCHANGE.

Largest Private System in the World to Be Installed for Garden Exhibition.

A welcome innovation in automobile show arrangements will be the installation of a complete private switchboard system for the Madison Square Garden show next January. There will be 150 individual telephones located in different booths and a switchboard with positions for eight operators. Sixty-five trunk lines will connect the Garden system with the Madison Square telephone exchange, which exceeds the number from the Waldorf-Astoria, which has heretofore had the largest private exchange.

Twenty-three employees will be required to handle the service; there will be a manager, two supervisors, eight day operators and seven night operators, with two relief operators and three messengers. It is expected there will be more than four thousand telephone calls every day during the show.

With this system in operation, it will be possible for each exhibitor at the show to telephone to other exhibitors, or to his office, albeit it is 1,000 miles away. There will be a special telephone directory for the Garden exhibitors.

BANKER BROS.' ENLARGED PLANT.

PITTSBURG, Dec. 4.—The Banker Brothers Company has moved into its new garage addition, its total floor space now being 50,000 square feet. In its storage department are three rooms, 40 by 115 feet each, one for electric cars, one for large gasoline machines and one for light gasoline touring cars, and a car and tire repair shop and a stockroom. Porters take care of the cars in active use. There are nine repair pits, five wash-racks and twenty charging-boards for electrics. In the vulcanizing plant twenty tires can be revulcanized at once. Forty expert chauffeurs who work for patrons of the company have been given a fine, large reading and pool room on the second floor.

The company has a big department for the manufacture of special parts, including bodies, tops and glass fronts, and has woodworking, painting and trimming rooms. More than 3,000 electric lights are used in illuminating the building and signs. To secure absolutely pure water the company drilled an artesian well 300 feet deep. It now has seventy-six employees. Arthur L. Banker, president of the company, is in active charge of the plant.

PLANS FOR MEXICAN ENTERPRISE.

Ambitious plans for supplying Mexico with automobiles of the Mercedes, Panhard and other types in large numbers built in a plant to be erected near the City of Mexico, were made public on November 20, in the Mexican capital, in conjunction with the announcement of the granting of a concession by the government to L. C. Browne for the establishment of such an industry.

Under the name Mexican Automobile & Bicycle Manufacturing Company, some of the most prominent and wealthy men in Mexico City have organized to conduct the enterprise and have applied for a charter under the laws of Delaware. It is expected that the construction of a factory will be begun shortly, and by the terms of the concession the company guarantees to invest not less than $150,000. The plant, it is declared, will embrace about fifteen buildings and have a large capacity—estimated at ten autos and ten bicycles a day. The machinery will be electrically operated.

By manufacturing in Mexico the high duties will be avoided, enabling the company to produce the machines at nearly 50 per cent. less than the imported cars now cost. Aluminum bodies are to be built from native metal made by a new company that recently began operations in Mexico, and it is also intimated that tires may be made from native rubber.

Skilled mechanics are to be taken down to Mexico from the United States and Europe. The general manager and superintendents of the automobile and bicycle departments are also to be engaged here or across the Atlantic. A complete repair shop is to be a feature of the enterprise, and the plans are reported to embrace also the operation of an electric cab service in Mexico City.

BODY COMPANY EXPANDING

PONTIAC, MICH., Dec. 2.—A reorganization of the Pontiac Body Company has been effected, and with the completion of improvements now in progress the company will be able greatly to increase its output. For the season of 1905-'06 it now has orders on its books for $170,000 worth of work, and, altogether, the coming season promises to be a banner one.

R. F. Monroe, who held controlling interest in the company, and also the position of general manager, has purchased the interests of Chauncey Brace, H. F. Messenger, J. A. Jacobes, J. A. Graley and Albro Green. In the reorganized company Mr. Monroe has associated with him D. E. Strohn, superintendent of the factory, and John Parker, bookkeeper.

The company has five big contracts which alone will give sufficient business for the coming season. They are with the Cadillac and Blomstrom companies, of Detroit, the Buick Motor Company, of Flint, the Bartholomew Company, of Peoria, Ill., and the Lebanon Motor Works, of Lebanon, Pa. In addition the company has several smaller contracts, including those with the Welch and Rapid Motor companies, of this city.

Factory improvements now being made include a new power house, 35 by 28 feet in size, and a new boiler and engine, the latter of 200 horsepower. Plans for installing a new electric dynamo to furnish lighting current for the factory are also nearly completed.

In regard to a rumor that the Pontiac Body Company was about to become a branch of the Cadillac Motor Car Company, of Detroit, Mr. Monroe, manager of the company, declares it to be untrue.

WASHINGTON SHOW IN FEBRUARY.

WASHINGTON, D. C., Dec. 4.—The week of Feb. 5 to 10 has been selected for the Washington automobile show, and sanction has been granted by the National Association of Automobile Manufacturers. This date is a full month earlier than that of past exhibitions in this city, and conflicts with the date of the Chicago show—February 3 to 10—but the local dealers think that the earlier date will add two months to the coming season.

A review of the past season shows more than 500 actual sales of automobiles in the national capital. This is a very large number for this city, but the indications are that 1906 will see the sales reach 1,000. This statement may seem optimistic, but when one dealer puts in his order for 300 runabouts of one make—and all the other dealers will sell some—it may not be far wrong.

TRADE ASSOCIATION PLANS.

New Philadelphia Organization Embraces 85 Per Cent. of Local Companies.

PHILADELPHIA, Dec. 4.—The amalgamation last month of the two local automobile trade associations was a stroke of business policy which will in all likelihood redound to the advantage of all concerned. The new organization embraces 85 per cent. of the automobile and accessories dealers doing business within the boundaries of Philadelphia county and representing nearly all the high-grade cars built in this country.

The combination will be continued under the name of the older body—the Philadelphia Automobile Trade Association—and will in the future transact its business from a central headquarters to be established within the coming week, which will be in charge of a permanent secretary, who will be prepared at all times to furnish information to visiting tradesmen and tourists. Here will be kept on file all the automobile trade literature, route information, etc., useful to car owners. It is intended, indeed, to make the headquarters an automobile trade club, and with that object in view a location will be selected within easy walking distance of Automobile Row, if not on the Row itself.

Officers to be elected at the annual meeting of the association have been nominated as follows: A. E. Maltby, to succeed himself as president, W. F. Smith for vice-president and J. Morse for secretary-treasurer. For the Board of Directors there were nominated W. F. Smith, Rambler; L. E. Hoffman, Ford; Samuel Cohen, Reo; and Percy L. Neel, of the Quaker City Automobile Company. The election will be held next Tuesday night, and, of course, the entire ticket will go through, only one set of candidates having been named. With the exception of President Maltby, all the officers are new men.

The first step toward the next local show has been taken by the appointment of the following committee to manage the affair: W. C. Barrows, W. F. Smith, W. J. Foss, John A. Wister and Percy L. Neel. A sanction for March 3 to 10 has been applied for, those dates having been selected after a long discussion. The question of where the show is to be held is practically settled. It having been demonstrated that none of the armory buildings is equal to the demands for space which will be made, it was decided to secure the National Export Exposition Building at Thirty-second and South streets, West Philadelphia. This building is more than twice as large as any of the armories, and being on the line of the Pennsylvania railroad, at South street station, is advantageously located for out-of-town exhibitors, who can land their cars and cases practically at its doors. This building was used by the convention that nominated McKinley and Roosevelt, and the crowds on that occasion were handled with surprising rapidity and dispatch by the transportation lines.

The decision of the association to hold the next annual automobile show in the National Export Exposition building in West Philadelphia, was received with satisfaction.

As at present constituted, the Philadelphia Automobile Association includes the following concerns:

ACTIVE.

Acme Motor Car Co., Apperson Bros. Co., Autocar Co., H. Bartol Brazier, Fairmount Engineering Works, Ford Motor Car Co., Foss-Hughes Motor Car Co., Gawthrop & Wister, Thos. B. Jeffery & Co., Kelsey Motor Car Co., Keystone Motor Car Co., Locomobile Co. of America, Martin & Hart, The Motor Shop, Pennsylvania Electric Ve-

OLDSMOBILE AGENTS BOARDING SPECIAL TRAIN AT LANSING, MICH., TO ATTEND MICHIGAN-WISCONSIN FOOTBALL GAME ON NOVEMBER 18, ON THE OCCASION OF THE RECENT GATHERING OF AGENTS TO INSPECT THE NEW OLDS MODELS.

hicle Co., Quaker City Automobile Co., Reo Motor Car Co., White Sewing Machine Co., Winton Motor Carriage Co.

Associate.

Diamond Rubber Co., Fisk Rubber Co., J. L. Gibney & Bro., Hartford Rubber Co., F. K. Mears, Pennsylvania Rubber Co.

MAY DISPOSE OF YALE RIGHTS.

TOLEDO, O., Dec. 4.—Negotiations are pending whereby the Yale cars, now manufactured by the Consolidated Manufacturing Company, of this city, may be taken over by another concern and built in a factory devoted entirely to the automobile business. Several offers have been made, it is said, both by out-of-town and local companies.

The Consolidated Manufacturing Company at present employs upward of 600 men in its automobile and other manufacturing departments, but owing to a lack of room and the large amount of business the company has in other lines, it is willing to dispose of its automobile department, providing a satisfactory deal can be made, and it appears that one is near at hand, according to the statement of the general manager. The loss of the plant to Toledo would be felt, for the Yale machine is popular in this city and in northwestern Ohio.

Even though the Consolidated company disposes of the Yale automobile, it will continue to make automobile castings, in which it now has a large business.

TO ABANDON AUTO BUILDING.

INDIANAPOLIS, Dec. 4.—It was announced by an official of the Standard Wheel Company here to-day that this company would no longer engage in the manufacture of automobiles. The company has made the Overland car, and the announcement came as something of a surprise to those interested in automobiles in this city.

The company has been manufacturing automobiles for three years, and it was supposed that it would have a new model on the market for next year within a few weeks. No reason is given for the decision except that the company feels that it should devote its efforts to the manufacture of wheels.

It is said that the company still holds the rights to the Overland and also a quantity of material, but that it has not been decided what will be done with either.

Eddie Bald was guilty of an atrocious pun on his own name recently. While it is a fad with most drivers to ride bareheaded, Eddie persists in wearing a cap. He was testing a new Columbia chassis on the roads outside of Hartford the other day, when he was held up by some acquaintances, and, in the course of the talk that ensued, Eddie was asked why he always wore a cap. After carefully making ready to throw in his clutch for a quick get-away, Eddie tossed back the response: "Oh, because I'm Bald."—New York *World*.

News and Trade Miscellany.

A circular sent out by the Automobile Club of America calls attention to the fact that the official program of the annual automobile exhibit of the club will be published by the Exhibition Committee for general distribution *without charge* to all who visit the show; that it will contain a complete list of all exhibitors, with names and addresses, location of their exhibits and floor plans of the Armory, and that the program will contain no advertising matter of any kind.

August Hemery, winner of this year's Vanderbilt Cup Race, who was suspended for a year by the Automobile Club of France, has, according to an authoritative report, been reinstated after making apologies.

B. L. Brown, who has had charge of the electric work in the Standard Automobile Company's big plant in Pittsburg for several years, has organized the B. L. Brown Company and leased the garage at Baum and Beatty streets now occupied by the Hiland Automobile Company, which will soon move to its new garage in Center avenue. The Brown Company will take over the Pope-Waverley agency which the Standard has had, as that company is going out of the electric business. Mr. Brown will handle nothing but electrics.

A "good roads" wave is sweeping over Oceana County, Mich. A few days ago a check for $1,250 was received from the state by Shelby township as the state's share of the cost of a mile and a quarter of stone road built during the past season. Recently a "good roads" meeting was held at the Crystal Town Hall and the proposition of adopting the township road system was considered. The voters of Benona township are considering a proposition to bond the township for $10,000 for the purpose of building four miles of macadam highway. During the year 1905 nearly $35,000 has been expended by the several townships and villages in the county for road improvement.

It is announced that Paul Stamsen and Harry Lowes, of Muskegon, Mich., will make the trip from there to San Francisco, Cal., this winter by motorcycle. The two will start about January 1 from Muskegon, and will make the trip via Chicago. From Chicago they will take a southwest route to avoid the severe storms which would be encountered in a direct western course. The route will take them through Missouri, Kansas, Colorado, New Mexico, Arizona and California. The men will be employed by a motorcycle manufacturing company, and expect to make the trip in thirty-five days.

During a large fire in the downtown business district of Indianapolis, recently, an extraordinary pressure at the water pumping station resulted in the bursting of a 36-inch water main in one of the downtown streets. Dr. T. A. Wagner was driving his automobile over the place at the time the main burst, and without warning his car was raised by the pavement as it was forced up by the water, but almost miraculously the car passed the dangerous place in safety.

The Elston Automobile Company, of Indianapolis, has closed its establishment and S. W. Elston has accepted a position as manager of the Indiana Automobile Company. Mr. Elston is one of the best-known automobile men in Indianapolis, having been one of the pioneer dealers in autos in that city. During the past season his company had the agency for the Maxwell line, but this agency has been given to the Fisher Automobile Company and the Indiana Automobile Company has completed arrangements for the Indiana agency for the Oldsmobile, which was recently relinquished by the Fisher company. The Indiana company will also carry the Cadillac, Winton, Franklin and Autocar next season.

That the motor truck is gradually being adopted in place of horse-drawn vehicles by business houses is shown by the recent sale of Packard trucks to the Standard Oil Company, of Chicago, and to Schwarzenbach, Huber & Co., silk merchants, of New York. The sale to the former company was made after a thorough investigation and demonstration of the truck. Two western firms who have recently adopted motor vehicles as delivery wagons are The Emery, Bird, Thayer Dry Goods Company and the Jones Dry Goods Company, both of Kansas City, Mo.

The Standard Roller Bearing Company, of Philadelphia, has purchased the property of the Pennsylvania Iron Company, at Forty-ninth street and Merion avenue, which adjoins its present property. The property purchased includes a four-story brick building, into which the company will move its ball bearings, axle and brass foundry departments. The company is at present erecting a foundry for making crucible steel castings.

Michelin & Cie., of Paris, makers of the Michelin tires, have established an American agency at 6 West Twenty-ninth street, New York, under the name of the Michelin Tire American Agency, Inc.

The French Aero Club has received word from James Gordon Bennett, donor of the cup for the international automobile races, offering a trophy for the annual international balloon contest.

It is expected that A. N. Mora, of Rochester, N. Y., will soon start an automobile factory employing sixty skilled workmen, in the village of Newark, if a proposed agreement whereby the Newark Board of Trade will raise $1,000 toward paying the rent of a factory for one year is concluded. Carpenters have already begun overhauling an old factory to put it in shape for Mr. Mora.

The L. W. Pond Machine and Foundry Company, of Worcester, Mass., which has for years manufactured metal planers, announced last week that the entire plant of the company will be given over to the manufacture of commercial and pleasure automobiles, a line of sample cars to appear within two months. The company is to be well represented at the New York and Boston shows.

The Marysville Motor Co., of Marysville, O., has been organized to manufacture automobiles. Officers of the new company have been elected as follows: H. A. Stevenson, president; George Rausch, secretary, and L. T. Henderson, treasurer. Harry Tarkington, who was superintendent of the Sommer Company's factory at Detroit, will be manager.

Farmers between Mechanicsburg and Urbana, Ohio, are circulating a petition which will be presented to the county commissioners, asking that the roads be closed to automobilists. They allege that their horses become frightened at the machines and that it is with difficulty that accidents have been averted.

A number of Twin City automobilists have used wood alcohol in the circulation system during the cold weather this fall, and report great success with the liquid as an anti-freeze. Owners of Maxwell cars have been especially pleased with the results.

L. C. Jandorf has rented the building formerly occupied by Smith & Mabley at Seventh avenue and Thirty-eighth street, New York, where he will conduct a salesroom for new and second-hand cars.

E. S. Partridge, vice-president of the Decauville Automobile Company, arrived recently from Europe. While abroad, Mr. Partridge attended the London automobile show at Olympia, and spent some time in Paris, where arrangements were closed for the importation of Decauville cars for the New York show.

The Davenport Automobile Company, Davenport, Ia., which will handle the Pope-Toledo and Northern cars during the coming season, has leased the building on Main street, formerly occupied by Bayliss & Eagal, and will move into the premises before the end of the year.

The Reliable Automobile Company, of Tacoma, Wash., general agents for the Packard, Cadillac and Winton cars, has opened a garage and general repair shop at 111-115 South Eighth street.

The Mitchell Automobile Company, of Chicago, Ill., is erecting a two-story garage and repair shop adjacent to its salesroom on Michigan avenue, which it is expected will be completed this month.

The Grout Brothers Automobile Company has placed its New York agency in the hands of Munsing & Chapman, of 1855 Broadway.

On Tuesday last a dinner party was given James Gibney, of Philadelphia, member of the firm of Gibney Bros., prior to his departure for Europe the next day. Mr. Gibney goes to Hanover, Germany, where he will closely study the various processes of manufacturing Continental tires.

The latest car to secure representation in Philadelphia is the Jackson, which will be handled by the Diamond Motor Car Company, of 2117-19-21 North Broad street.

Ex-Manager F. W. Stockbridge, of the Philadelphia branch of the Reo company, has become sales agent of the Foss-Hughes Company, which handles the Pierce-Arrow, Cadillac and Baker electric cars in the same city.

The new garage being erected as an addition to the headquarters of the Brooklyn Riding and Driving Club, on Prospect Park Plaza, is nearing completion, and will afford accommodation for a large number of cars, the floor space aggregating nearly 20,000 square feet. The garage will be for the use of members of the club exclusively.

The Wayne Automobile Company, of Detroit, Mich., will be represented in Germany by Leopold, Robert & Co., Nidderstrasse 72, Frankfurt, A. M. Orlando Baker has secured the agency for the Wayne cars in West Alexandria, Ohio.

A gold medal has been awarded to the Olds Motor Works, of Lansing, Mich., for its exhibit at the Lewis and Clark Exposition at Portland last summer.

The Woods Motor Vehicle Company, of Chicago, Ill., announces the recent election as president of Louis E. Burr, who for many years has been connected with the C. P. Kimball Carriage Company as treasurer and general manager.

The New Amsterdam Motor Company, New York agents for the Crawford automobiles, is employing a unique method in selling a car. A prospective customer has the privilege of renting a car and giving it a week's trial before closing the sale.

Having taken the Indiana state agency for the Marmon car, the Gibson-Short Cycle and Auto Company, of Indianapolis, has greatly enlarged its establishment and expects to make further extensions within a short time. By its acquisition of the room adjoining its garage the company has now doubled its frontage. It will begin the erection of an addition 50 by 100 feet in the rear of its garage in a few weeks.

The name of the Indiana Ford Automobile Company, of Indianapolis, will be changed within a few days to The Columbia Electric Company, which has absorbed it. The latter company manufactures the Leader car. S. B. Frost, who has been assistant manager of the Columbia Electric Company, has resigned on account of his health and had been succeeded by F. M. Martindale. The company expects to have its new Model B. runabout on the market in about four weeks.

The Piedmont Motor Car Company has secured the agency for the Marmon cars in Atlanta, Ga. The Van Automobile Company, 4706 Washington avenue, St. Louis, will handle the same line in that city.

The Central Automobile Company, of Pittsburg, which has just opened for business in its new garage at 5989-5991 Center avenue, East End, has secured the agency for the Reo and the Stoddart-Dayton cars. Both are new agencies in Pittsburg. E. L. Seeley and G. F. Ferrier will have charge of the company's business.

The Keystone Automobile Company, of Pittsburg, which is now managed by G. P. Moore, formerly of Chicago, has sold fifteen 1906 White steamers and delivered eleven of them. Eight were limousine cars. The company has secured C. R. Meisner, of the White company, for an expert demonstrator and salesman.

S. W. Rushmore, of the Rushmore Dynamo Works, Plainfield, N. J., has gone to Paris to superintend the company's exhibit of searchlight equipment at the Paris show. While in France, Mr. Rushmore will make an extended trip through the country in a 60-horsepower Fiat car.

A. L. Riker, vice-president of the Locomobile Company of America, and A. L. Schulz, chief designer for the company, have gone to Paris to attend the automobile show.

Jacob Finkelstein, who for several years has had a bicycle and repair shop at Bay Shore, L. I., has purchased a lot opposite his present stand, on which he will erect an automobile garage and repair shop.

The Witherbee Igniter Company, heretofore of 27 Thames street, New York, has moved its plant to 541 West Forty-third street, where the company has a new five-story building, in which it will have adequate facilities to care for its increasing business.

The Mitchell Motor Car Company, Racine, Wis., has closed with the three Manley brothers, of Harvard, Ill., whereby the latter will mandle the Mitchell cars exclusively in Harvard and vicinity during 1906.

Jesse Lippincott Cassard, Jr., has acquired the agency of the Ford in Baltimore and will open in the Gill building as soon as it is completed.

An agency for the Pierce car has recently been established by the Southern Auto Company, of Baltimore.

Samples of the 1906 Ramblers will be received by the Fawkes Automobile Company, of St. Paul, the last of this week, and a number of prospective purchasers of new cars are waiting for them to arrive before buying. The Rambler is one of the most popular machines in St. Paul.

The Fostoria Motor Car Co. will be formed shortly for the purpose of manufacturing automobiles at Fostoria, O. The company will be capitalized at $300,000.

O. M. Houser has opened a garage in Chillicothe, O., on Mulberry street.

INFORMATION FOR BUYERS.

Dow Ignition Coils.—A new and very complete catalogue of ignition apparatus for explosion motors has been issued by the Dow Portable Electric Company, of Braintree, Mass.; the catalogue contains, in addition to descriptions and illustrations of many different coils, switches and plugs, a number of wiring diagrams showing the arrangement of ignition wiring. The coils for 1906 are all put up in such a way that any one or all of the units can be removed without disturbing any terminal connections and without using tools. Dry mica is used for insulation of spark plugs, the mica being wrapped around the spindle and then covered with mica washers, which are compressed under great pressure and then turnd off smooth. The Dow switches are said to be practically water proof; they are so arranged that either one of two sets of batteries can be used at will, or both may be cut out by placing the handle in the center or by removing the locking plug. A new timer, with roller contact, has been brought out. In this instrument the revolving central portion carries a steel roller that makes contact, in the case of a timer for a four-cylinder engine, with four flat steel springs, avoiding friction and shock. Each spring can be separately adjusted by means of an adjusting screw. This timer can be used with non-vibrator coils as well as with coils having vibrators. The Dow company also manufactures dry batteries for ignition work, volt meters and ammeters.

TRADE PUBLICATIONS RECEIVED.

Pope Motor Car Company, Waverley Department, Indianapolis, Ind.—Large colored sheet illustrating a number of Waverley electric automobiles used by women.

The Billings & Spencer Company, Hartford, Conn.—Card bearing on one side a perpetual calendar and on the other a list of the many specialties manufactured by this well-known concern.

W. F. and John Barnes Company, Rockford, Ill.—Catalogue of foot-power lathes for metal work; also chucks, dogs and other lathe accessories; also catalogue of upright drill, presses, grinders, chucks for drill presses, and so on.

American Electrical Novelty and Manufacturing Company, 308 Hudson street, New York.—Circulars illustrating the "Ever Ready" electric pocket lamps, decorating lamps, gas lighters, cigar lighters and electric novelties of various kinds.

Hayes Manufacturing Company, Detroit, Mich.—Catalogue of radiators, hoods, mudguards, tanks, dashes, running-boards, steps, mufflers and other sheet-metal specialties. Special sets of mudguards are made for standard machines, and the catalogue gives illustrations of cars equipped with these accessories.

Baker Brothers, Toledo, O.—Catalogues of drilling, boring and tapping machines for high-speed and special manufacturing work, including drill presses with intermittent feeds, crankcase boring machines and cylinder boring machines. Also catalogue of the Colburn key-way cutter and slotter, which is a remarkably rapid and accurate machine for this class of work.

Philadelphia Grease Manufacturing Company, Boston, Mass., and Philadelphia, Pa.—Circular regarding Philadelphia lubricants, made in three forms: hard, for compression cups, packing ball bearings and the like; soft, for cups, packing transmission gearcases, and such work; and liquid, for general lubricating work and use in oil guns. The hard greases, the manufacturers state, will not melt and drip, but form thin films

INDEX TO ADVERTISERS

Acetylene Gas Illuminating Co..... 25
Am. Anti-Puncture Tire & Auto Co..... 58
American Ball-Bearing Co..... 47
American Coil Co..... 24
American Machine Mfg. Co..... 27
American Veneer Co..... 33
Anderson & Sons Co..... 28
Ardrey Vehicle Washer Co..... 40
Atwood Mfg. Co..... 27
Auto Brass & Aluminum Co..... 28
Auto Rebuilding Co..... 35
Auto Top Mfg. Co..... 30
Automobile Equipment Co..... 27
Automobile Supply Co..... 26

Badger Brass Mfg. Co..... 49
Baker Motor Vehicle Co..... 79
Baldwin Chain Mfg. Co..... 28
Bartholomew Co..... 67
Bay State Stamping Co..... 24
Beebe, A. M..... 30
Bemus, T. Alton..... 42
Beverly Mfg. Co..... 29
Blomstrom Motor Car Co., C. H..... 93
Boker & Co., H..... 25
Boston Auto Gauge Co..... 38
Boston Automobile Exchange..... 42
Boston Cycle & Sundry Co..... 25
Bowser & Co., S. F..... 32
Brennan Motor Co..... 26
Briscoe Mfg. Co..... 38
Brown Mfg. Co., J. C..... 56
Buckeye Mfg. Co..... 76
Buckeye Wheel Co..... 56
Burgin Bros..... 30
Byrne-Kingston Co..... 45

Cadillac Automobile Co..... 80
Camp Cycle Co..... 41
Canedy, Earl..... 26
Capitol Foundry Co..... 28
Carbondale Chemical Co..... 41
Carr, F. S..... 38
Central Body Co..... 30
Champion Co., Albert..... 36
Champion Mfg. Co..... 26
Chandlee & Chandlee..... 67
Chaney Mfg. Co., A..... 37
Chelsea Clock Co..... 24
Chicago & Eastern Illinois Ry..... 54
Chicago & Northwestern Ry..... 41
Cleveland-Canton Spring Co..... 42
Cleveland Motor Car Co..... 71
Cleveland Oil Soap Co..... 40
Clyde Line..... 33
Collins & Sons, G. A..... 30
Connecticut Tel. & Electric Co..... 24
Continental Caoutchouc Co..... 64
Continental Motor Mfg. Co..... 29
Corbin Motor Vehicle Corporation..... 89
Corcoran Bros. Co..... 51
Corwin Mfg. Co..... Cover
Covert Mfg. Co..... 28
Crawford Automobile Co..... 76
Crucible Steel Casting Co..... 28
Cullman Wheel Co..... 28

Dac Automobile Supply House..... 53
Daimler Mfg. Co..... 84
Davis Mfg. Co..... 39
Dayton Electric Mfg. Co..... 26
Dayton Motor Car Co..... 69
Diamond Chain & Mfg. Co..... 28
Diamond Rubber Co..... 66
Dietz, R. E..... 48
Dixon Crucible Co., Joseph..... 32
Dow Portable Electric Co..... 25
Draper Bros. Co..... 24
Duff Mfg. Co..... 43
Dyke Auto Supply Co., A. L..... 58

E. H. V. Co., The..... 82
Eclipse Buggy Co..... 30
Edmunds & Jones Mfg. Co..... 47
Elbridge Electric Mfg. Co..... 44
Eldredge Electric Mfg. Co..... 24
Electric Storage Battery Co..... 41
Electric Vehicle Co..... 76
Elmore Mfg. Co..... 79
Erie Stamping & Mfg. Co..... 32
Excelsior Supply Co..... 24

Fairmount Engineering Works..... 24
Fast, Otto..... 29
Ford Motor Co..... 70
Ford & Dennen..... 24
Franklin Mfg. Co., H. H..... 83
Franklin Portable Crane & Hoist Co..... 40
Frost, F. E..... 29

G & J Tire Co..... 65-59
Gabriel Horn Mfg. Co..... 40
Garage Equipment Co..... 25
Garford Co., The..... 39
Garlick Auto Prop Co..... 58
Gibbs-Brower Co..... 40
Gilbert Mfg. Co..... 25
Goodrich Co., B. F..... 59
Goodyear Tire & Rubber Co..... 60
Grand Hotel, The New..... 54

Ham Mfg. Co..... 49
Hardy Co., The R. E..... 26
Harris Oil Co., A. W..... Cover
Hartford Machine Screw Co..... 28
Hartford Rubber Works..... 64
Hatcher Auto-Parts Co..... 35
Havemeyer Oil Co..... 24
Haynes Automobile Co..... 77
Heinze Electric Co..... 44
Herz & Co..... 26
Hoffman, Geo. W..... 25
Holly Bros. Co..... 24 and Cover
Hopson & Chapin Mfg. Co., The..... 28
Hyatt Roller Bearing Co..... 42

Illinois Central Railroad..... 67
Imperial Brass Mfg. Co..... 56
Imperial Wheel Co..... 37

Jackson Automobile Co..... 69
Janney, Steinmetz & Co..... 27
Jeffery & Co., Thomas B..... 80
Jersey Brake Co..... 41
Jones Speedometer..... 34

Kells Mfg. Co., W. J..... 28
Kent Mfg. Works, Atwater..... 24
Kirkham Motor Mfg. Co..... 29
Knox Automobile Co..... 75

Leather Tire Goods Co..... 63
Lee Mfg. Co..... 52
Leeds Co., The..... 54
Light Mfg. & Foundry Co..... 58
Lipman, C. E..... 24
Lobee Pump Co..... 29
Locke & Co..... 41
Locomobile Co. of America, The..... 94
Logan Construction Co..... 75
London Auto Supply Co..... 30
Lozier Motor Co..... 95
Lustre Chemical Co..... 43

Madison-Kipp Lubricator Co..... 41
Manhattan Automobile School..... 27
Manhattan Storage Co..... 47
Manning Mfg. Co..... 25
Manufacturers' Motor Car Co..... 47
Mathewson Motor Car Co..... 76
Maxwell-Briscoe Motor Co..... Cover
Merritt Co..... 36
McCord Mfg. Co..... 29
McDonald, Wessels & Ames Co..... 28
Mezger, C. A..... 50
Miami Pattern Works..... 24
Michelin, Tire..... 62
Middletown Auto Body Co..... 30
Miller, Charles E..... 54
Milwaukee Steel Foundry Co..... 28
Moline Automobile Co..... 78
Monarch Automobile Co..... 78
More Power Co..... 24
Morgan, B..... 32
Morgan, W. J..... 66
Morgan & Wright..... 62
Mosier & Co., A. R..... 35
Moss Photo Engraving Co..... 68
Motor Car Equipment Co..... 42
Motor Car Specialty Co..... 36
Motor Car Supply Co..... 28
Murdock, Jr., Co., James..... 24
Myers-Dayton Top Co..... 30

National Battery Co..... 41
National Carbon Co..... 43
National Motor Vehicle Co..... 78
National Oil Heating Co..... 25
National Sales Corporation..... 52
National India Rubber Co..... 35
Neustadt Auto Supply Co..... 42
Never Miss Spark Plug Co..... 26
New York Gear Works..... 58
New York School Auto Engineers..... 31
New York & New Jersey Lubricant Co.. 25
Newmastic Tire Co..... 27
Nicholsberg Mfg. Co., H..... 30
Nordyke & Marmon Co..... 77
Northern Mfg. Co..... 88
Nuttall Co., R. D..... 28

Oakes & Dow..... 26
Ofeldt & Sons..... 25
Olds Motor Works..... 72-73
Owen Chemical Co..... 51

Pacific Tucking & Mfg. Co..... 34
Packard Electric Co..... 24
Packard Motor Car Co..... 91
Parish & Bingham Co..... 27
Pedersen, J. T..... 27
Peerless Motor Car Co..... 87
Pennsylvania Rubber Co..... 60
Philadelphia Grease Mfg. Co..... 25
Pierce Co., The George N..... 74
Pioneer Brass Works..... 28
Pneumatic Tire Protector Co..... 41
Pope Motor Car Co..... 85
Post & Lester Co..... 25
Powell Mfg. Co..... 32
Prest-o-Lite Co..... 48

Railway Appliances Co..... 25
Rajah Auto Supply Co..... 58
Raimes & Co..... 42
Rainier Co., The..... 90
Reo Motor Co..... 81
Remy Electric Co..... 43
Republic Rubber Tire & Shoe Co..... 25
Riverside Body Factory..... 30
Robert Instrument Co..... 24
Roberts & Co., O. G..... 32
Rose Mfg. Co..... 50
Royal Battery Co..... 52
Royal Equipment Co..... 24
Royal Motor Car Co..... 75
Rubay, Leon..... 26
Rushmore Dynamo Works..... 48-49

Saks & Co..... 21
Sampson-Leather Tire Co..... 61
Seaboard Air Line..... 27
Seidler-Miner Electric Co..... 26
Shaw, Ora D..... 24
Shawver Co..... 25
Sheddan Mfg. Co..... 57
Shelby Steel Tube Co..... 58
Sixth Annual Automobile Show..... 61
Skinner & Skinner..... 29
Speed Changing Pulley Co..... 47
Speed Indicator Co..... 42
Spicer Universal Joint Mfg. Co..... 33
Splitdorf, C. F..... 26
Sprague Umbrella Co..... 38
Springfield Metal Body Co..... 30
Springfield Moulding Works..... 30
Smith & Mabley..... 96
Snow, N. H..... 30
St. Louis Car Co..... 42
Standard Foundry Co..... 28
Standard Welding Co..... 57
Steel Ball Co..... 25
Stevens Arms & Tool Co..... 84
Stimpson, Edwin B..... 25
Stoip Mfg. Co..... 41
Streit Machine Co., A..... 29
Sunbury Mfg. Co..... 43
Swinehart Clincher Tire & Rubber Co... 56
Syracuse Aluminum & Bronze Co..... 28

Tennant Auto Tire Co..... 33
Thomas Motor Co., E. R..... 92
Timken Roller Bearing Axle Co..... 45
Trebert Auto & Marine Motor Co..... 29
Trebert Gas Engine Co..... 39
Tritt Electric Co..... 40
Tucker, C. F..... 24
Tuthill Spring Co..... 43

Ultra Pump & Power Co..... 33
Uncas Specialty Co..... 42
Uneedme Tool Co..... 56
Underwood Typewriter Co..... 36
Upton Motor Co..... 24

Veeder Mfg. Co..... 34
Vehicle Specialty Co..... 30
Voigt, Em..... 86

Wabash Railroad..... 32
Walker Co., E. C..... 25
Waltham Mfg. Co..... 31
Walworth Mfg. Co..... 23
Warner Instrument Co..... 34
Way Muffler Co..... 55
Wayne Automobile Co..... 27
Webster Mfg. Co..... 44
Weed Chain Tire Grip Co..... 40
Welch Motor Car Co..... 67
Western Oil Pump Co..... 25
Western Tool Works..... 75
Weston Electrical Instrument Co..... 33
Wheeler & Schebler..... 46
White Sewing Machine Co..... 82
Whitlock Coil Pipe Co., The..... 27
Whitney Mfg. Co..... 32
Wilson Auto Clock Co..... 32
Winkley Co., The..... 32-35
Winton Motor Carriage Co..... Cover
Witherbee Igniter Co..... 36
Wolverine Auto and Com. Vehicle Co... 69
Wray Pump & Register Co..... 35

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